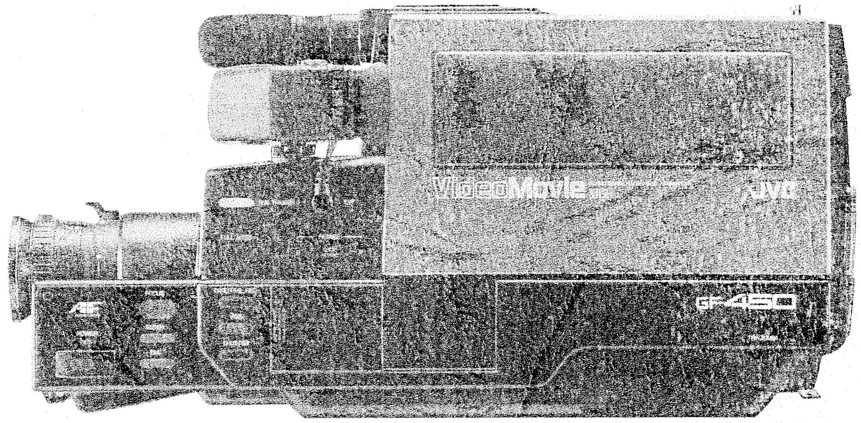
JVC

SERVICE MANUAL

VHS VIDEO MOVIE VHS PAL

GF-450EG

for Saudi Arabia



HQ
High Quality

SPECIFICATIONS

Format : VHS standard
Power source : DC 9.6 V ⎓
Power consumption : 9 W
Signal system : PAL
Recording system : Luminance: FM recording
Colour: Converted sub-carrier direct recording
Conforms to VHS standard
Cassette : VHS cassette
Tape speed : 23.39 mm/sec
Recording time
Max. : 240 minutes (with E-240 cassette)

VIDEO

Output : 1 Vp-p, 75 ohms, unbalanced (via AV IN/OUT connector)
S/N ratio : 42 dB (with Rohde & Schwarz noise meter)

AUDIO

Output : -6 dBs, 1 k-ohm (via AV IN/OUT connector)
Input : -8 dBs, high impedance, unbalanced
Microphone input : -68 dBs, high impedance, unbalanced
Pickup : 1/2" format CCD
Minimum required illumination : 10 lux (at F/1.4)
Illumination range : 10 – 100,000 lux
Lens : F/1.4 ~ 2.0 f = 9 – 54 mm, 6:1 two-speed power zoom lens with auto iris control and macro position, filter diameter 49 mm
Viewfinder : Electronic viewfinder with 0.7" black/white CRT
Selectable high-speed shutter : 1/1000 second
Colour temperature switching : Switchable (3,200 K/4,500 K/5,500 K)
White balance adjustment : Full-auto/preset standard
Operating temperature : 0°C to +40°C
Operating humidity : 35 % to 80 %
Storage temperature : -20°C to +50°C
Weight : 2.3 kg (with viewfinder)
Dimensions : 128(W) x 193(H) x 391(D) mm (incl. viewfinder)

AA-V5EG SPECIFICATIONS

Power requirement : AC 110 – 240 V∿, 50/60 Hz
Power consumption : 21 watts
Output : DC 14 V ⎓ 1.1A (Charge)
DC 9.6 V ⎓ 1.2A (VideoMovie)
Charging system : Constant current, peak detection, timer controlled
Dimensions : 68(W) x 38(H) x 150(D) mm
Weight :Approx. 380 g

Provided accessories:

AC power adapter/battery charger	AA-V5EG
Battery pack	BN-V6GU
AV output cable	VC-V826E

Carrying handle
Carrying bag
Shoulder strap
Electric viewfinder
Lens cap
Lens hood
Battery for clock operation (CR2025)
Conversion plug

For optional accessories, refer to pages 29 and 30.

Design and specifications subject to change without notice.

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No. 86043
October 1988

NOTE: For a technical description, please refer to Technical Guide VTG86008 GF-450 PAL.

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ATTENTION/ACHTUNG/ATENCION/ATTENTIE/انتباه

Use this plug adapter depending on the type of your AC wall outlet.

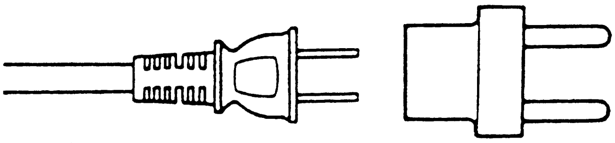
Utiliser cet adaptateur de fiche en fonction du type de votre prise secteur.

Falls erforderlich, diesen Netzsteckeradapter für den Anschluß an Netzsteckdosen verwenden.

Use este adaptador de enchufe de acuerdo con su tipo de tomacorriente.

Gebruik afhankelijk van het type stopkontakt deze verloopstekker.

استعمل فيشة التيار الكهربائى طبقا لنوع بريزة التيار المتردد AC بالحائط.



Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (▨) parts are critical for safety.
   Replace only with specified part numbers.
   Note: **Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.**

3. Fuse replacement caution notice.
   Caution for continued protection against fire hazard.
   Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors
   5) Barrier

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

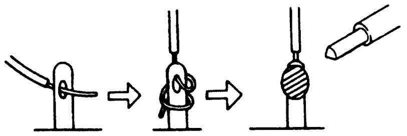


Fig. 1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10—15 kg of force in any direction will not loosen it.

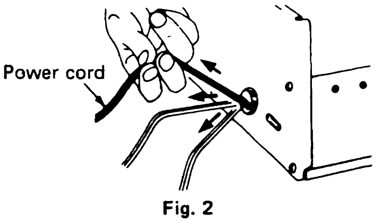


Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
    In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.
    1) **Connector part number** : E03830-001
    2) **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.
    3) **Replacement procedure**
       (1) Remove the old connector by cutting the wires at a point close to the connector.
       Important : Do not reuse a connector (discard it).

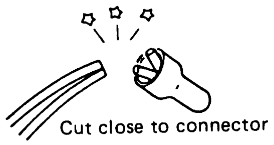


Fig. 3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

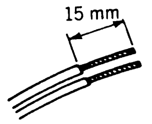


Fig. 4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

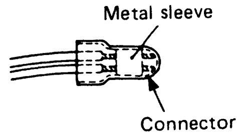


Fig. 5

(4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

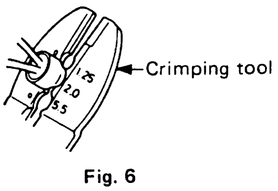


Fig. 6

(5) Check the four points noted in Fig. 7.

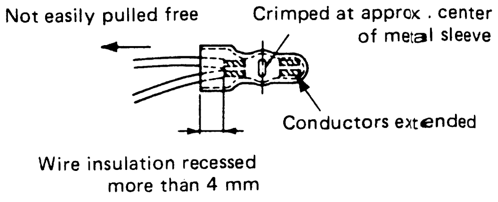

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig. 7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. **Insulation resistance test**
Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. **Dielectric strength test**
Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. **Clearance distance**
When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

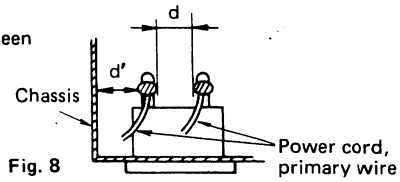


Fig. 8

4. **Leakage current test**
Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).
Measuring Method: (Power ON)
Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

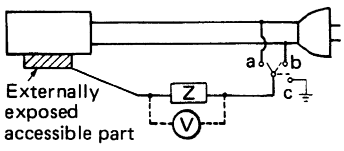


Fig. 9

5. **Grounding (Class I model only)**
Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).
Measuring Method:
Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

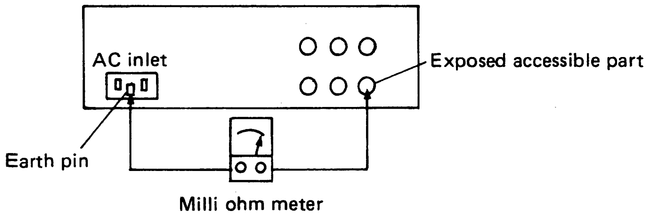


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R ≧ 1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 minute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	–	AC 900 V 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R ≧ 10 MΩ /500 V DC	AC 3 kV 1 minute (Class II) AC 1.5 kV 1 minute (Class I)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	0.15 μF 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

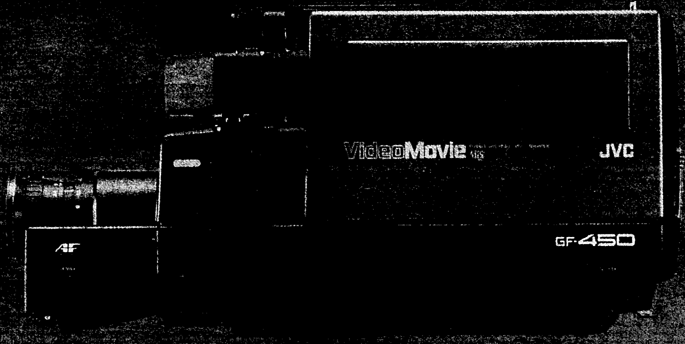
INSTRUCTIONS

VideoMovie

VHS
PAL
HQ
High Quality

CAMERA-RECORDER/PLAYER
GF-450

Specifically for the GF-450E/AA-V5EG



CCD
Charge Coupled Device

AF
AUTO FOCUS

JVC

Thank you for purchasing the JVC GF-450E VideoMovie. Before use, read this instruction booklet carefully for obtaining the best results from your new unit.
Diagrams are on the reverse side of this page. Fold it out and keep it opened so that you can refer to the diagrams when you are reading this booklet.

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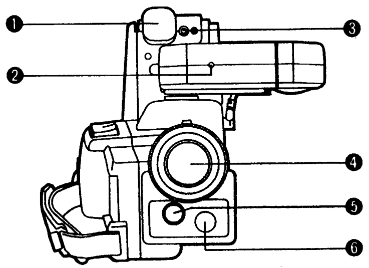
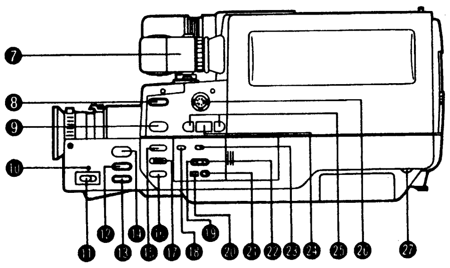
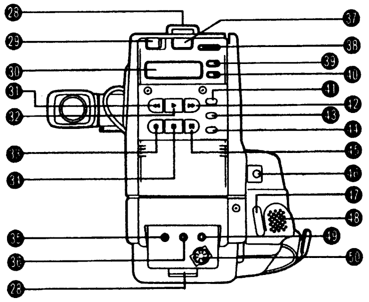


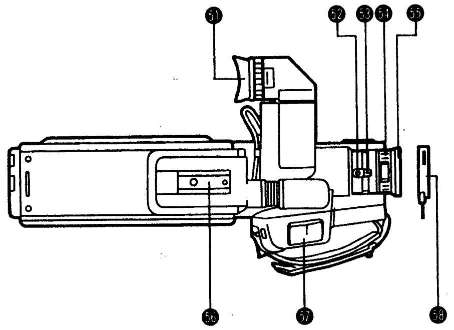
Left side



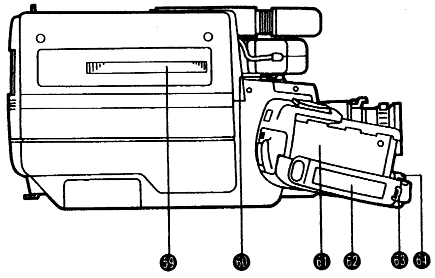
Rear view



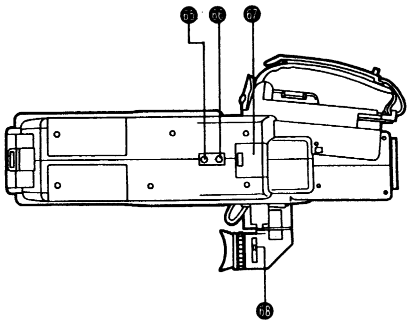
Top view



Right side



Bottom view



SAFETY PRECAUTIONS

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

This equipment should be used with DC 9.6 V ⎓ only.

CAUTION:
To prevent electric shocks and fire hazards, do NOT use any other power source.

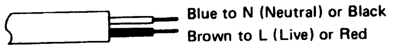
The AA-V5EG AC Power Adapter/Battery Charger should be used with 110 – 240 V∿, 50/60 Hz only.

Caution:
To prevent electric shocks and fire hazards, do NOT use any other power source.

IMPORTANT (In the United Kingdom) Mains Supply (240 V∿, 50 Hz only)

IMPORTANT

Do not make any connection to the Larger Terminal coded E or Green. The wires in the mains lead are coloured in accordance with following code:



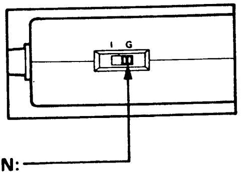
If these colours do not correspond with the terminal identifications of your plug, connect as follows:
Blue wire to terminal coded N (Neutral) or coloured Black.
Brown wire to terminal coded L (Live) or coloured Red.
If in doubt – consult a competent electrician.

Note
We recommend that you should disconnect the AC cord from the outlet.

VHS PAL   HQ High Quality

- VideoMovie is designed exclusively for the VHS video cassette. Only cassettes marked VHS can be used with this unit.
- HQ VHS is compatible with existing VHS equipment.

Warning on lithium battery
The battery used in this device may present a fire or chemical burn hazard if mistreated. Do not recharge, disassemble, heat above 100°C or incinerate.
Repalce battery with Matsushita Electric, CR 2025; use of another battery may present a risk of fire or explosion.
- Dispose of used battery prompty.
- Keep away from children.
- Do not disassemble and do not dispose of in fire.



ATTENTION:
The system select switch on the side of the optional RF unit RF-V3E has been set to G (Continental PAL, 5.5 MHz).

CAUTION:
To prevent shock, do not open the cabinet. No user serviceable parts inside. Refer servicing to qualified personnel.

NOTES:
- The rating plate (serial number plate) and safety caution of the main unit are on its bottom.
- The rating plate (serial number plate) of the viewfinder is on its bottom.
- The rating plate (serial number plate) of the AC power adapter/battery charger is on its bottom.

The provided viewfinder is the VF-GF450E. Do not use any other viewfinder with the GF-450E.

This equipment has been produced to comply with Directive number 82/499/EEC.

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PRECAUTIONS

For safety, strictly observe the following instructions.

- Do not open the cabinet.
- Prevent inflammables, water and metallic objects from entering the unit.
- Do not use the unit when there is lightning in the vicinity. Disconnect the power cable of connected equipment.

Avoid using the unit under the following conditions:

- Places subject to excessive humidity or dust.
- Near appliances generating strong magnetic or electric fields (speakers, broadcasting antennas, etc.).
- Places subject to soot or steam such as near a cooking stove.
- Places subject to excessive shock or vibration.
- Near a television set (rolling pictures or howling might result).
- Extremely hot places.

Do not expose the unit to high temperatures over 50°C for long periods.

If the unit should be subjected to direct sunlight, or left in a closed car in summer, or placed near a heater, the CCD and the auto-focus sensor may deteriorate and the cabinet may become deformed. Furthermore, this also may cause the transistors and other electronic and mechanical parts to malfunction. Remember the following:

- Do not leave the unit in places of over 50°C.
- Do not use the unit in places of over 40°C.
- Do not use the unit in places of below 0°C.
- Protect the unit from excessively dry or excessively humid conditions (below 35 % or above 80 % humidity)
- For long storage, select a place between -10°C and 30°C.

Take special care for protection of the unit.

- Do not allow the unit to become wet.
- Do not leave the unit in closed cars on hot summer days.
- Take special care not to drop the unit or strike it against hard objects. Protect from shocks during transportation.

Make it a rule to observe the following instructions.

- Do not remove the battery pack or disconnect other power supply units during recording or playback before pressing the POWER switch to OFF. If not observed, this will cause tape damage.
- When the unit is not in use, remove the battery pack.

Keep the lens and viewfinder eyepiece always clean.

- When the lens is dirty or dusty, blow it off first and then gently wipe with a soft brush or lens cleaning paper.
- The lens is likely to become moldy if left dirty.

Be careful not to damage the CCD and auto-focus sensor.

- Do not keep the lens directed at extremely bright objects such as the sun or other light sources for long periods. Although the CCD is less susceptible to such burn than a tube would be, caution should be exercised when using this unit. Most importantly, the lens should be capped except while actually shooting.
- Do not direct the eyepiece of the viewfinder at the sun.

Auto-focus requries a bit of consideration.

- Do not touch the focus ring while the auto-focus mechanism is in operation as this could damage the auto-focus mechanism.
- When a filter or a special-effect lens is to be attached to the end of the lens, be sure to turn power off or switch from the Auto-focus mode to the Manual mode. NEVER attempt to attach a filter or lens while the auto-focus mechanism is operating as this will result in malfunctioning. (If a teleconversion or wide-angle conversion lens is attached, the auto-focus mode cannot be used.)

Handle the unit carefully.

- Protect the microphone from excessive shocks.
- Do not carry the unit by holding it only by the viewfinder.

Moisture condensation disenables use of the unit.

- You have observed that pouring a cold liquid into a glass will cause drops of water to form on the glass's outer surface. This same phenomenon occurs on the head drum of a video recorder when the recorder is moved from a cool place to a warm place, after heating a cold room, under extremely humid conditions or in a place directly subjected to the cool air from an air conditioner.
- Moisture on the head drum can cause severe damage to the video tape, and can lead to internal damage to the recorder itself.
- If moisture condensation occurs on the head drum, a condensation warning appears in the counter display and the unit enters the Stop mode, unable to function. In such a case, wait for a few hours until the indicator disappears.

Maintenance

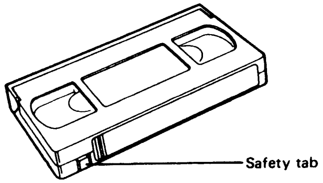
- When the cabinet is dusty, clean by gently wiping with a soft cloth.
- Avoid the use of strong cleaning agents such as benzine or alcohol as they may damage the cabinet.
- Cleaning should be done only after the battery pack has been removed or other power units have been disconnected.

Serious malfunctioning

If malfunctioning occurs, stop using the unit immediately and consult your local JVC dealer.

VIDEO CASSETTES

- The GF-450E employs only video cassettes carrying the VHS mark.
- Recording onto prerecorded tapes automatically erases the previously recorded video and audio signals.
- An inverted cassette cannot be inserted.
- Do not load and unload the cassette repeatedly without allowing the tape to run at all. This will slacken the tape and thereby damage it.
- The cassette is equipped with a safety tab to prevent accidental erasure. When the tab is removed, recording is impossible. If you wish to record on a cassette whose tab has been removed, use adhesive tape to reseal the slot.
- To avoid excessive exposure to dust and fingerprints, do not open the front tape cover.



Storage of cassettes

- Avoid exposing the cassettes to direct sunlight. Keep them away from heaters.
- Avoid storing the cassettes in humid or dusty palces.
- Do not drop the cassettes. Do not expose them to violent vibrations or shocks.
- Do not expose the cassettes to strong magnetic fields (near a motor, transformer or magnet).
- Place the cassettes in cassette cases and position them vertically.

FEATURES

- Allows direct playback with no additional components necessary.
- 1/1000 of a second high-speed electronic shutter for sharp, clear playback of fast-action shots.
- Newly developed high-resolution 1/2" field-storage type CCD (Charge Coupled Device) pickup.
- One-button full-auto operation of focus, exposure, and white balance.
- Powerful, two-speed 6:1 power zoom with macro function.
- HQ (High Quality) System for superlative picture quality.
- Maximum of 240 minutes recording time on a single tape.
- Insert editing function.
- Audio dubbing facility.
- Animation recording function for more creative and novel recording.
- Index code marking for convenient location of specific points on the tape.
- BGM (Background Music) IN connector for mixing two sound sources.
- Flying erase head for precise, quality assemble/insert editing.
- Retake function for quick re-recording of scenes when necessary.
- Equipped with AV IN/OUT connector for dubbing and editing.
- High-sensitivity/low-lag design: allows shooting in light as low as 10 lux.
- Image Sensing auto-focus.
- Automatic Colour Tracking white balance with three preset positions.
- Backlight compensation button.
- Audio/video fader linked to start/stop trigger.
- Large, easy-to-read LCD.
- Ultra-compact adjustable electronic viewfinder (monochrome CRT, 0.7-inch screen) with diopter control, also for instant on-the-spot playback.
- Selectable automatic date recording function.
- Recordable date/time display.
- Elapsed recording time counter.
- Second recording start/stop button provided.
- Dubbing mode switch provided for best results when dubbing.
- Selectable quick review function.
- One-button recording standby mechanism.
- Master Edit Control system: allows control of both GF-450E and connected designated VCR using GF-450E's controls, and preroll editing for edits free of transition-point gaps and noise.
- Shuttle Search in both directions.
- Unique grip battery doubles as palm grip, saving weight and space.
- Ergonomic design with palm grip and finger rest for trigger control.
- Three-way power supply flexibility: battery pack, AC power adapter, and car battery.
- Compact and light weight: only 2.3 kg.

POWER SUPPLY SYSTEM

The convenient 3-way power supply system gives you a choice of the most appropriate power supply unit, depending on the application.

CAUTION
- No function is available without power supply.
- Do not use any power supply other than specified.
- Never attempt to use these power supply units with any equipment other than the VideoMovie.

Where AC power is not available

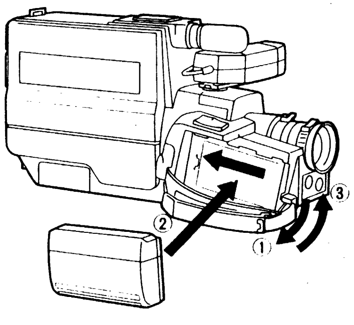
Use the battery packs:
- BN-V5GU (Regular)
- BN-V6GU (High-capacity)
- BN-V7GU (Super-high-capacity)

Note:
The battery pack has been kept in the uncharged state for shipment. Therefore, before use, be sure to charge it. See page 28.

Attaching the Battery Pack

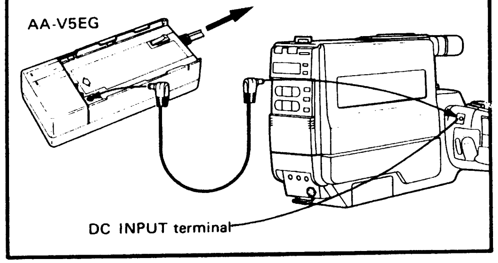
① Pull down the battery pack release lever.
② Align the battery pack over the outline in the battery pack mount, and slide the battery pack into place in the direction of the arrow.
③ Push up on the battery pack release lever, until it locks into place.

To remove the battery pack, pull down the battery pack release lever and slide out the battery.



With AC power

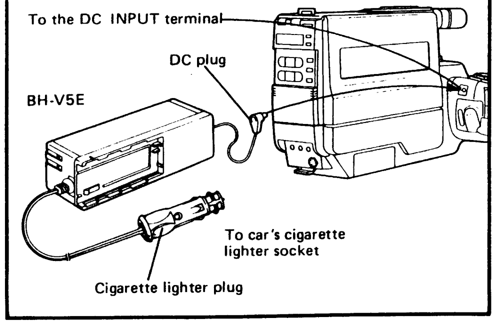
Use the provided AA-V5EG AC power adapter/battery charger.



In a car

Use the optional BH-V5E car battery charger.

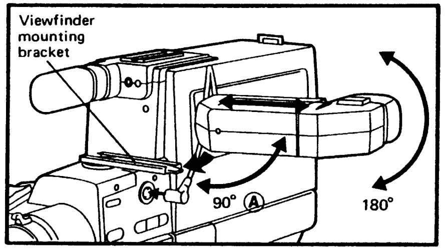
- Leave the car's engine idling when using the car battery. (For use with 12 V negative-grounded cars only.)



BASIC PREPARATIONS

Switch off power before mounting or removing viewfinder.

Mounting the viewfinder

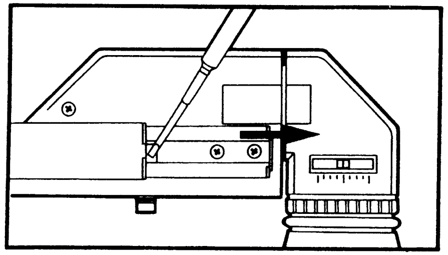


1 Slide the viewfinder holder into the mounting shoe.

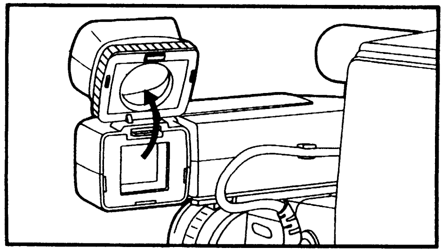
2 Connect the viewfinder cable to the viewfinder cable connector (EVF). Run it through the cable clamp.

Removing the viewfinder

Slide away the viewfinder holder until the latch engages the hole. Push the latch with a small pointed object (like a ballpoint pen) and pull out the viewfinder.

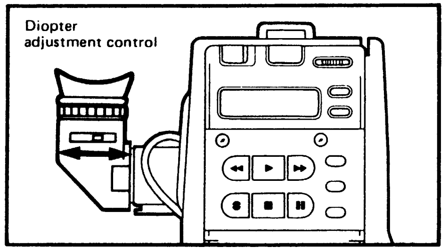


Opening the eyepiece



The viewfinder eyepiece can be opened for cleaning or better viewability in playback.

Viewfinder adjustment



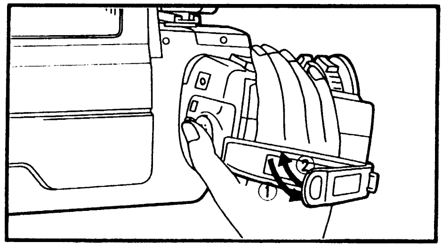
Diopter adjustment

The viewfinder lens can be adjusted to suit the operator's eyesight by moving the dioptric adjustment control located underneath the eye cup.

Positioning the viewfinder

The viewfinder can be positioned for best viewability. It can be slid left and right, rotated 90° and tilted 180°. the horizontal, outer-most position allows left-eye monitoring. When storing or carrying the camera, rotate and keep the viewfinder at position Ⓐ.

Adjusting the Grip Strap



1 Separate the Velcro strip to expand the loop.

2 Pass your right hand through the loop and grasp the lens grip. Adjust the length of the strap to suit your hand size and refasten the Velcro strip.

CONTROLS AND CONNECTORS

Refer to the diagrams on the front foldout page.

❶ **Exclusive unidirectional microphone**

❷ **Tally lamp**
Lights during recording.

❸ **External microphone jack (MIC) (Page 19)**

❹ **6:1 zoom lens**

❺ **Auto-focus sensor window**
Allows light to enter for measuring the camera-to subject distance.

❻ **White balance sensor window**
Allows light to enter for white balance adjustment.

❼ **Electronic viewfinder**
For monitoring scene being shot or the playback picture after recording.

❽ **Second recording start/stop (SUB TRIGGER) button**

❾ **FULL AUTO button**
Pressing this button puts the focus and white balance under automatic control and selects the standard shutter speed.

❿ **Power indicator**

⓫ **POWER switch (Page 9)**
Slide to turn the power on. The Stop indicator appears on the LCD. Slide again to switch off power.

⓬ **FADER button (Page 15)**
To fade out the picture to black blank screen, press this button, then press the recording start/stop button to start fading out. To fade in from a black blank screen, press this button, then press the recording start/stop button to start fading in.

⓭ **BLC button (Page 19)**
Iris control is always automatic. For backlight compensation, press this button. While it is being pressed, the iris is 1 – 2 f-stops wider than the automatic setting.

⓮ **FOCUS select button**
Switch to AUTO for automatic focus, and switch to MANUAL to focus manually.

⓯ **DATE/TIME REC ON/OFF button**
Press this button when you do not wish to record the date/time. This will remove date/time indications from the viewfinder. Press again to record date/time. Date/time will reappear in the viewfinder.

⓰ **SHUTTER select button (Page 19)**

⓱ **VISS button (Page 19)**
Press this button once to mark an index code onto the tape.

⓲ **WHITE BALANCE select button (Page 9)**
The white balance is manually selectable using this button.
✲ : Halogen or tungsten lighting.
▭ : Fluorescent lighting.
☀ : Daylight.

⓳ **DATE/TIME SET button (Page 16)**
Use to set the built-in clock and date function.

⓴ **REC TIME ON/OFF switch**
When this switch is set to ON the viewfinder displays the elapsed recording time. Switch to OFF to cancel the display. Unloading the cassette resets the display to "00.00". Note that this convenience functions only when camera shooting is performed.

㉑ **REC TIME RESET button**
Press this button to reset the elapsed recording time to zero.

㉒ **DATE/TIME SELECT button (Page 16)**
Use to select the portion of the clock or date settings to be changed. Cycles through the year, month, day, hour, and minute settings. To end adjustment, press once after selecting the minute portion.

㉓ **DISPLAY SELECT button**
Press this button to select the date/time display and recording mode. It cycles through the modes in the following order:

Auto date record reserve → Date display → Date/time display → Time display

The auto-date-record function automatically displays and records the date for 5 seconds upon turning on the power and beginning recording. Before recording begins, this mode is indicated in the viewfinder by auto date record reserve indication "–.–.–".

㉔ **QUICK REVIEW button (Page 10)**

㉕ **RETAKE buttons (Page 10)**
If you want to review the end of the previously recorded segment for confirmation, press this button from the Record Standby mode.

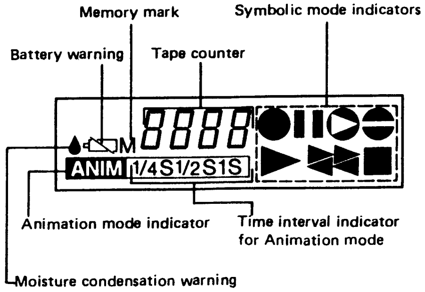
㉖ **Viewfinder cable connector**
Connect the viewfinder cable.

㉗ **TRACKING control (Page 13)**
Minimizes noise bars, if observed, during playback.

㉘ **Slots for shoulder strap**

㉙ **EJECT switch**
To open the cassette holder.

㉚ **Liquid Crystal Display (LCD)**



Symbolic mode indicator

STOP:	■	REVERSE SHUTTLE SEARCH:	▶◀◀
PLAY:	▶	FORWARD SHUTTLE SEARCH:	▶▶▶
PAUSE: (STILL)	❚❚	MASTER EDIT CONTROL:	▶ Blinking
RECORD:	●	INSERT PAUSE:	❚❚⊳
RECORD PAUSE:	●❚❚	AUDIO DUB PAUSE:	❚❚⊖
QUICK REVIEW:	●❚❚ Blinking	INSERT:	⊳
REWIND:	◀◀	AUDIO DUB:	⊖
FAST FORWARD:	▶▶	INDEX CODE MARKING:	● Blinking

㉛ **REW/SHUTTLE SEARCH button**
Pressing this button in the Stop mode rewinds the tape; pressing it in the Play mode allows fast playback in reverse.

㉜ **PLAY button**
Press to start playback.

㉝ **AUDIO DUB button (Page 26)**
Press this button together with the PLAY button for audio dubbing. Audio dubbing is possible only on the longitudinal audio track.

㉞ **STOP button**
Press to engage the Stop mode.

㉟ **REMOTE control jack**
For connection of the optional RM-P1U pause remote control unit.

㊱ **Earphone jack (PHONE)**

㊲ **RECORD standby button**
Press to engage the Recording standby mode. To start recording, press the recording start/stop button ⑧ or ㊼.

㊳ **DUBBING ON/OFF switch**
Normally, set to OFF. For best picture quality when dubbing, set it to the ON position.

㊴ **Counter MEMORY button (Page 14)**

㊵ **Counter RESET button (Page 14)**

㊶ **EDIT START Button**
When dubbing from the GR-450E to a designated JVC VCR, pressing this button starts VideoMovie playback and, in synchronization with it, the VCR's recording.

㊷ **FF/SHUTTLE SEARCH button**
Pressing this button in the Stop mode fast-forwards the tape; pressing it in the Play mode allows fast playback.

㊸ **INSERT REC button (Page 25)**
Press this button for insert editing.

㊹ **ANIM (ANIMATION) button (Page 20)**
Press to select recording lengths — 1/4, 1/2 or 1-*second for composing animation shots.*

㊺ **PAUSE/STILL button**
Press to view a still picture during playback or pause playback.

㊻ **DC IN terminal**
For connection of the provided AC power adapter/battery charger, optional car battery charger or car battery cord for DC power supply. (Page 5)

㊼ **Recording start/stop button (Trigger button)**
Press this button in the Recording Standby mode to start recording. Pressing it again re-engages the Recording Standby Mode.

㊽ **Finger rest**
Place your thumb on this grooved area next to the start/stop switch between switch operations.

㊾ **BGM (Background Music) IN connector (Page 19)**
Connect an audio source for mixing the microphone input when recording or dubbing.

㊿ **AV IN/OUT connector**
Both audio and video signals may be delivered from this connector. To dub from this unit, connect the A/V input connectors of a second recorder to this connector, using the provided A/V cable. To play back from this unit to a TV set, make a connection between this connector and the TV's A/V input terminals using the A/V cable.
For playback with a TV set not equipped with A/V terminals, connect the RF-V3E RF unit (optional) to this connector and to the TV.

(51) **Eye cup**

(52) **Macro button**
Turn the zoom ring while pressing this button for macro shooting.

(53) **Manual zoom lever**

(54) **Manual focus ring**

(55) **Lens hood**

(56) **Accessory shoe**
Use this accessory shoe to attach the carring handle (provided) or an optional character generator.

(57) **Power zoom buttons**

(58) **Lens cap**
Cap the lens when not in use.

(59) **Cassette holder**
Insert a VHS video cassette for recording or playback.

(60) **Viewfinder mount (Page 6)**
Attach the provided viewfinder.

(61) **Grip-type battery mount (Page 5)**

(62) **Grip strap (Page 6)**

(63) **Lens cap hook**
This keeps the lens cap from swinging during shooting.

(64) **Battery pack release lever (Page 5)**

(65) **Tripod mounting socket (Page 31)**

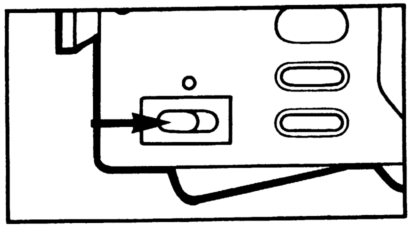
(66) **Stud hole**

(67) **CLOCK BATTERY compartment (Page 16)**
Holds the lithium battery that powers the date and time function.

(68) **Dioptric adjustment knob (Page 6)**

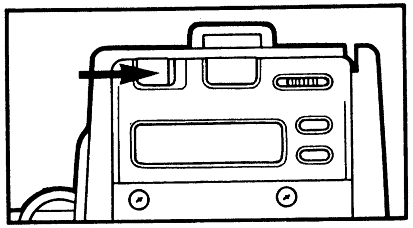
RECORDING OPERATION

1



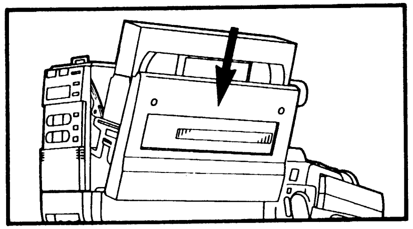
Slide the POWER switch to turn power on.

2



Open the cassette holder by pressing the EJECT switch.

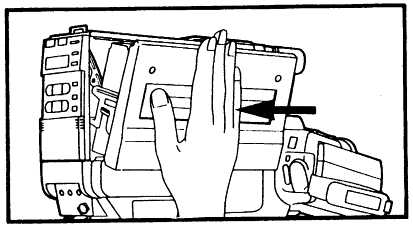
3



Insert the cassette with its printed arrow facing outward.

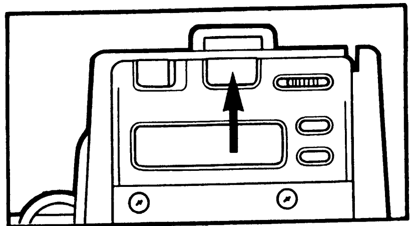
First remove tape slack, then insert the cassette correctly. See page 3.

4



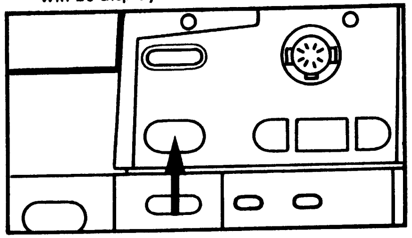
Close the cassette holder by pushing its center area.

5



Press the RECORD Standby button. The unit enters the Recording Standby mode.
"-" will be displayed in the viewfinder.

6

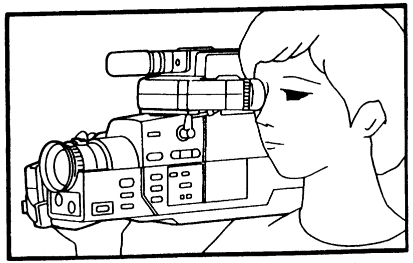


For full-auto operation, press the FULL AUTO button.

For manual override, use the WHITE BALANCE and FOCUS buttons.

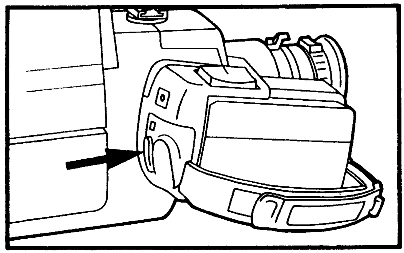
- Press the WHITE BALANCE button so that the required symbol appears on the viewfinder and on the LCD.
  - ✺ : when the subject is illuminated by a halogen or tungsten lamp.
  - ▥ : when the subject is illuminated by a fluoresent lamp.
  - ☼ : when you shoot in the daytime outdoors.
- When shooting under fluorescent light, always use the fluorescent light setting in the manual white balance mode for best results.
- For manual focus, press the FOCUS button so that MANUAL is shown on the LCD. A focus-aid indicator will appear in the viewfinder.

7



Determine the focus and composition by referring to the viewfinder image. For zooming, see page 18.
For date/time recording, see page 16.

8



Press the start/stop button.

- This causes REC to appear on the viewfinder screen, showing that recording is actually taking place.
- Be careful not to touch any buttons inadvertently during shooting.

9 To stop recording temporarily, press the start/stop button once again.

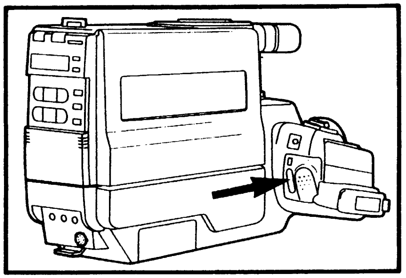
Quick Review function

- If you want to review the end of the last recording for confirmation, press the QUICK REVIEW button from the Recording Standby mode; the tape will be rewound for about 2 seconds for program time and played back automatically for this section, after which it will stop in the Recording Standby mode for the next shot.

Note:

- Distortion might occur when playback starts. This is normal.

10



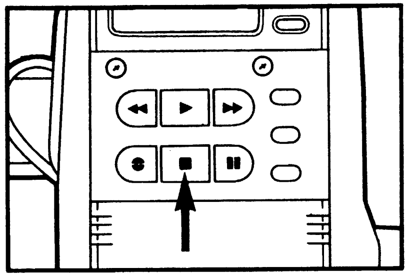
To restart recording, press the start/stop button.

- For a long pause, press the POWER switch to OFF to save battery power.
- If the Recording Standby mode continues for longer than about 5 minutes, the unit switches itself off automatically. To restart recording, turn the power on and press the start/stop button. This makes clean assembled recordings possible even after a long pause.

Assemble recordings

- Repeating steps 8 and 10 produces assemble recordings.
- If recording is restarted from the Stop mode, a few frames of the previously recorded picture is replaced with a new recording. To avoid this, follow the technique described in "Assemble Recording Technique-2" on page 12.

11



To end recording, press the STOP button.

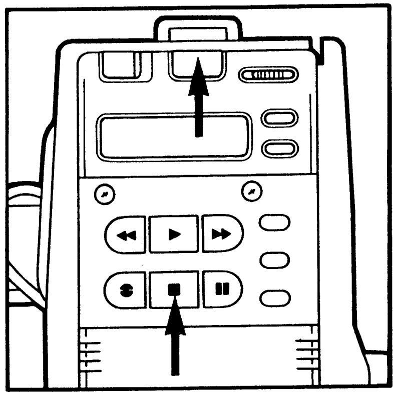
- After making sure that the tape has stopped, press the POWER switch to OFF.

Retaking a scene (Retake function)

After reviewing a recorded segment, you may decide to re-record it immediately. The Retake function is convenient for this.

1. Make sure the camera is in the Record/Pause mode.
2. Press either Reverse RETAKE or Forward RETAKE to reach the point you wish the new recording to start.
   When the button is released, the camera's Record/Pause mode is engaged.
3. Press the Recording Start/Stop button to start recording.

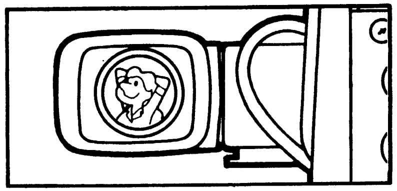
Rehearsal



If you wish to rehearse shooting angles, compose scenes, etc., without actually recording on the tape, press RECORD button while keeping the STOP button pressed. The aimed-at scene will appear on the viewfinder screen. For full-auto rehearsal, also press the FULL AUTO button. To engage the Recording Standby mode from rehearsal, press the RECORD button. To disengage the Rehearsal mode, press the STOP button.

- Rehearsal is possible whether a cassette is loaded or not.
- The power save circuit does not function during rehearsal. (For power save function, see page 12.)

Viewfinder Monitoring



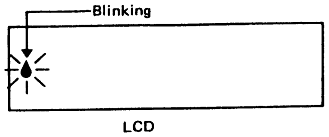
- Rewind the tape to a point from which you want to check the recording.
- Press the PLAY button, and you can view the playback picture on the viewfinder screen.

Notes:

- Pressing the PAUSE/STILL button during playback stops the picture on the viewfinder screen.
- Shuttle search is also possible in both directions.

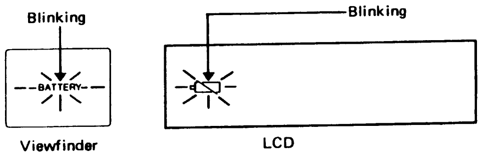
Warnings

Condensation warning



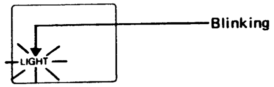
- This indicator blinks if excessive moisture condenses in the unit and the unit enters the Stop mode. In such a case, wait for a few hours until the indicator disappears. (See page 3)

Battery warning



- When the battery power is coming to an end, a battery warning indication appears both in the viewfinder and the LCD. Replace the battery pack with a fully charged one.
- After these indications appear, the power turns off automatically. In this state, however pressing the POWER switch while holding EJECT switch pressed turns the power on and ejects the cassette.

Low-light warning



- If the blinking "LIGHT" indicator appears on the viewfinder screen, the amount of light is insufficient. Increase the lighting.

POWER SAVE AND TAPE PROTECTION CIRCUIT

- To save battery power, the VideoMovie (when battery-operated) switches itself off automatically in the following situations:
  (1) When left for longer than 5 minutes in the Stop mode.
  (2) When left for longer than 5 minutes in the Recording Standby (Record-Pause) mode.
- To protect the tape, the VideoMovie (regardless of whether battery-operated or AC-powered) releases tape tension slightly and switches itself off automatically if left for longer than 5 minutes in the Recording Standby (Record-Pause) mode.
- For the same reason, the VideoMovie enters the Stop mode and switches itself off automatically if left for longer than 5 minutes in the Still (Play-Pause) mode.

Battery operation

STOP → POWER OFF
5 minutes

Battery/AC operation

REC PAUSE → POWER OFF
5 minutes

PLAY PAUSE (STILL) → STOP → POWER OFF
5 minutes

ASSEMBLE RECORDING TECHNIQUE — 1 (To replace the battery pack during recording)

1 If the battery warning appears in the viewfinder or the LCD while recording, stop recording by pressing the POWER switch to OFF, not the STOP button.

2 Replace the battery pack with a charged one.

3 Press the POWER switch to ON.
- The unit will be in the Recording Standby mode.

4 Press the recording start/stop button to start recording.

ASSEMBLE RECORDING TECHNIQUE — 2 (To record onto a partially recorded tape)

1 Play back the tape to a point where you wish a new recording to start.
- Use the SHUTTLE SEARCH button for faster location.

2 Press the PAUSE/STILL button at the located point.
- The unit will enter the Still mode.

3 Press the REC button.
- The unit will enter the Recording Standby mode.

4 Press the recording start/stop button to start recording.

Note:
Some picture distortion may occur at the transition point. This is not due to any defect of the unit.

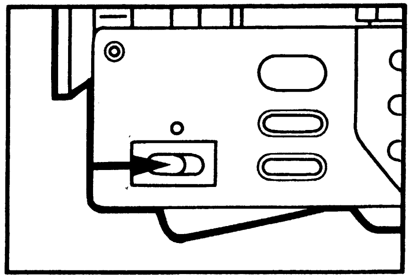
PLAYBACK

The GF-450E permits playback of recorded VHS video cassettes.
For connections refer to pages 21 and 22.

Preparation
- Set the aerial select switch of the RF-V3E RF unit to VIDEO and the TV receiver's channel selector to your video channel (specified AV channel).

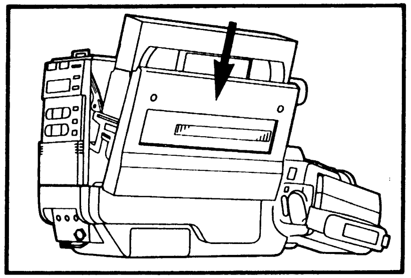
Connect a power supply unit. (Battery or AC operation: see page 5.)

1



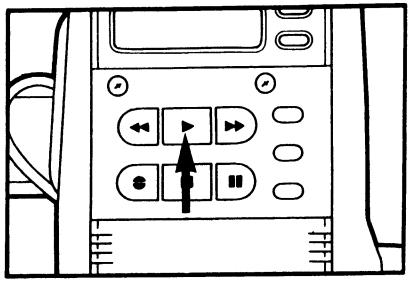
Slide the POWER switch to ON.

2



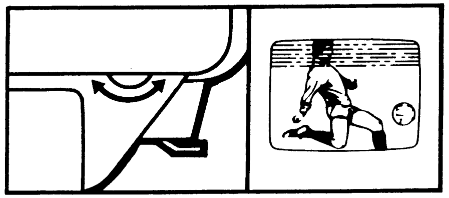
Insert a pre-recorded cassette.

3



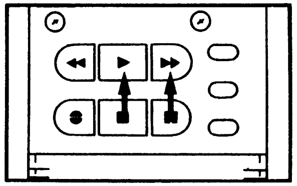
Press the PLAY button. Playback will start.

Tracking adjustment
If noise bars appear on the screen, adjust the TRACKING control. Turn it slowly in either direction to minimize noise bars. After playing a particular tape, return the TRACKING control to the center position.



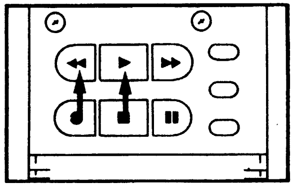
Shuttle Search

Fast-speed playback in the forward direction



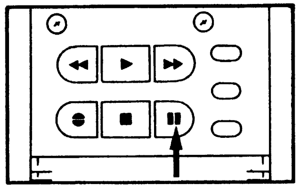
Press the FF button in the Play mode. Playback will be speeded up to 7 times normal speed as long as the button is being pressed.

Fast-speed reverse playback



Press the REW button in the play mode. The tape will be played back in the reverse direction at 7 times normal speed as long as the button is being pressed.

Still playback



Press the PAUSE/STILL button during playback. The picture will stop on the screen.

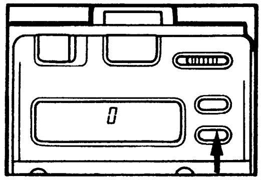
- After about 5 minutes of still playback, the unit enters the Stop mode automatically for tape protection and switches itself off.

Note:
- Noise may appear on the screen during Shuttle Search and still playback. This is not due to any defect of the unit.

Counter Memory Function

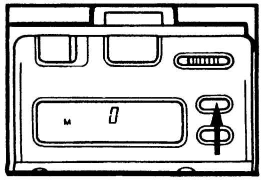
The GF-450E incorporates a counter memory mechanism which facilitates locating a specific tape segment.

1



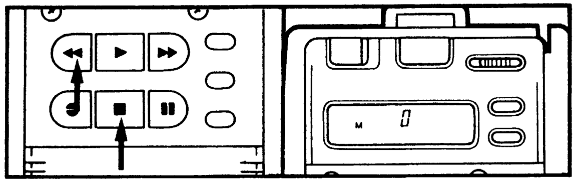
Press the RESET button to reset the counter to "0".

2



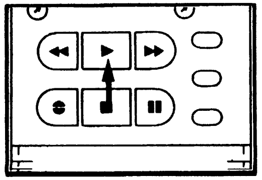
Press the MEMORY button. The "M" mark will appear.

3



After recording or playback, press the STOP button, then the REW button. The tape will automatically stop at the counter reading of around "0".

4



Press the PLAY button to start playback.

Notes:
- The counter memory function is effective in the Fast Forward mode as well.
- To cancel the memory function, press the MEMORY button.
- When the power supply unit is disconnected, all indications on the LCD disappear and the counter memory function is cancelled.

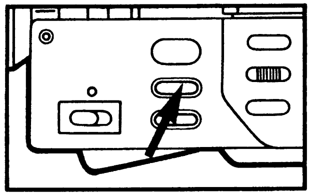
SPECIAL TECHNIQUES

Fade-in/out

The GF-450E is equipped with an automatic fade mechanism for allowing smooth fade- in and fade-out with a black-coloured blank screen. Audio also fades in sync with video.

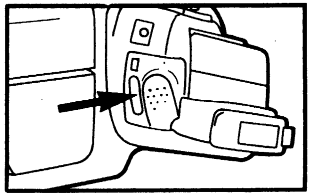
Automatic fade-in

1

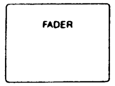


Determine the composition in the Recording Standby mode and press the FADER button to reserve the fade-in mode.

2



Press the start/stop button. The screen will quickly become black and recording begins. When the start/stop button is released, fade-in will start. It will be completed in 5 seconds. If the start/stop button is not released when pressed, the black picture will remain on the screen and be recorded.



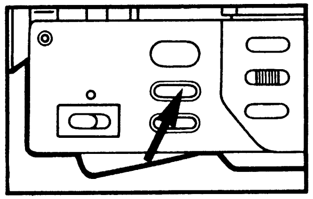
FADER is displayed in the viewfinder when fading is reserved, and continues to be displayed until fading in or out is completed.

Fade-in
Fade-out

Automatic fade-out

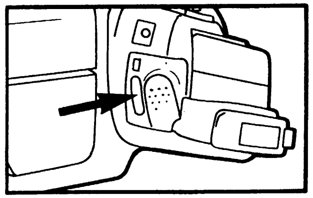
1 Start shooting as usual.

2



Press the FADER button to reserve the fade-out mode.

3

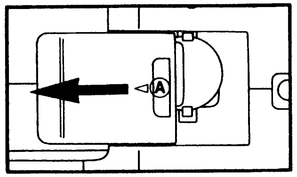


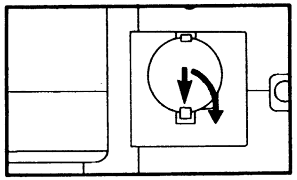
Press the start/stop button. Fade-out will start and be completed in 5 seconds. When completed, Recording standby mode is entered. If the start/stop button is not released when pressed, the final black picture remains on the screen and continues to be recorded, until the button is released.

Warning on lithium battery
- **Dispose of used battery promptly.**
- **Keep away from children.**
- **Do not disassemble and do not dispose of in fire.**

Recording the date/time

Battery insertion





This battery powers the date/time function.

1. Slide the cover off the CLOCK BATTERY compartment on the bottom of the VideoMovie by pressing lightly on the section labelled Ⓐ in the diagram.
2. Insert the provided lithium battery **with the plus (+) side up.**
3. Slide the cover on until it clicks.

Note:
- Switch off the unit's power before inserting the battery.

Battery replacement

The battery lasts for about one year. When the lithium battery warning (▶ E) appears in the viewfinder, this battery needs to be replaced. Obtain a new CR 2025 lithium battery and follow the following procedure.

1. Remove the battery by pressing the knob in the direction of the arrow.
2. Insert the new CR 2025 **with the plus (+) side up.**
3. Slide the cover back until it clicks.

Note:

Switch off the unit's power before removing old battery.

Replace battery with Matsushita type CR 2025 only. Use of another battery may present risk of fire and explosion.

Date/time setting

Before adjusting the date and time for the first time or after replacing the batteries, 1.1.87 blinks in the viewfinder, indicating the clock needs to be set.

① Switch the unit's power on, 1.1.87 will blink in the viewfinder. Press MONITOR button to enter Rehearsal mode.

② Press the DATE/TIME SELECT button – the year blinks.

③ Press the DATE/TIME SET button to choose the correct number.

④ Press the DATE/TIME SELECT button to select the next item to change, with the item selected changing in the following sequence:

→ Year → Month → Day → Hour → Minute → Finish Adjustment

⑤ Repeat steps ② and ③ to set all items. After the minute setting has been performed, press the DATE/TIME SELECT button, and items will cease blinking, and the clock will resume normal function. For the auto date record mode, the auto date record reserve indicator will appear.

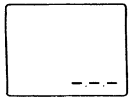
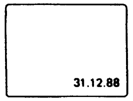
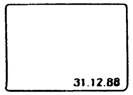
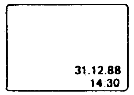
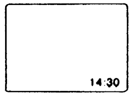
Date/time recording

The date, time, or date and time can be displayed and recorded according to the selected mode. Press the DISPLAY SELECT button to cycle through the modes in the following order:

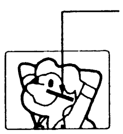
→ Auto date record reserve → Date display → Date/time display → Time display

- When the auto-date-record function is selected, "–.–.–" appears in the viewfinder, until recording begins. As long as this function is chosen, the date will be automatically displayed and recorded for about 5 seconds following the first operation of the recording start/stop button after the power is turned on.
- Auto date record reserve indication will cease to be displayed if the DATE/TIME REC ON/OFF button is set to OFF unless power is provided again.

Date/time recording indications

Auto date record		Date display	Date/time display	Time display
 –.–.– Auto date record reserved	 31.12.88 Auto date record executed	 31.12.88	 31.12.88 14:30	 14:30

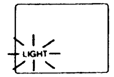
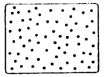
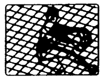
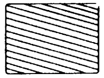
Auto-focus



- A small area around the center of the picture, which varies depending on the zoom and focus conditions, is used to detect focus. (No actual indication provided on the screen.)

CAUTION
- Do not touch the focus ring while the auto-focus mechanism is in operation.
- Be careful not to cover the auto-focus sensor window, otherwise accurate focusing will not be possible.
- When not in use, do not leave the VideoMovie in the Autofocus mode with power on; otherwise light entering the auto-focus sensor window will operate the auto-focus mechanism, consuming power.

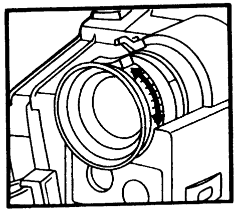
Correct focus may not be obtained in the following situations. In such cases manual focusing should be performed to obtain proper focus.

	Low illumination where the under-exposure indicator appears on the Viewfinder screen.
	Minute patterns or identical patterns that are regularly repeated.
	Two subjects at different distances overlap in the same scene.
	Slanted lines only.

Note:
- If the lens and/or auto-focus sensor window are smeared with staint or blurred with condensation, accurate focusing is not possible. Keep them clean. If they become dirty, wipe with a piece of soft cloth. When condensation occurs, dry them by wiping with a soft cloth or wait for conditions in which they become dry.

Manual focus

If the manual focus mode is selected, proceed as follows:



① Zoom in on a subject by pressing the "T" button.

② Focus onto it by turning the focus ring.

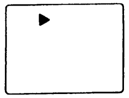
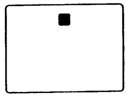
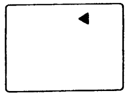
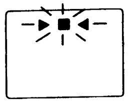
③ Determine the composition by pressing the "W" button.

Caution:
Convering the white balance sensor while manually focusing will result in poor colour reproduction.

Note:
- When you use the manual focus mode, be sure to focus the lens in the maximum telephoto position. If you focus in on a certain subject in the wide-angle position, sharply-focused images cannot be obtained when zoomed up because the depth of field is reduced at longer focal lengths.

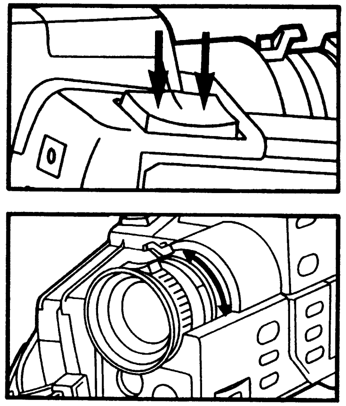
FOCUS INDICATORS

The focus indicators on the viewfinder screen function in the manual focus mode.

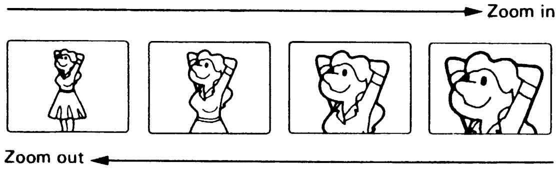
Condition	Indication	Corrective operation
Focus point behind the subject	 ▶	Turn the focus ring clockwise until the center square lights.
Correct focus	 ■	Keep the focus ring in the same position.
Focus point in front of the subject	 ◀	Turn the focus ring counterclockwise until the center square lights.
Indication not possible because of low contrast	 –▶ ■ ◀–	Estimate the subject distance and set the focus ring referring to the distance scale on it.

Zooming

When the focal length of the lens is varied by turning the zoom ring, the image appears to come nearer to or retreat from the viewer.



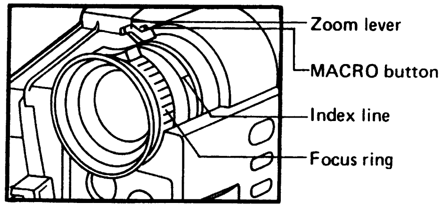
Power zooming
Press "T" for zooming in and "W" for zooming out. Two zooming speeds are available. For slow-speed zooming, press lightly. For regular-speed zooming, press firmly.



Manual zooming
Rotate the zoom lever downwards for zooming in and upwards for zooming out.

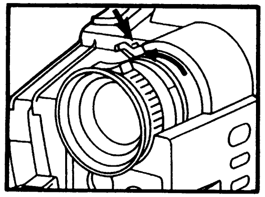
Macro Shot

Normally, focusing is possible only for subjects that are more than 1.1 m away from the camera. By setting the lens to the Macro mode, it is possible to manually focus in on any subject located inside that limit, right up to the front of the lens. The MACRO and ZOOM ranges combined give continuous shooting ability from close-up to infinity.



Engage MACRO

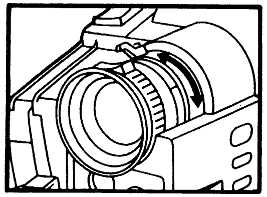
1



While pressing in the macro button, turn the zoom lever in the direction of the arrow until the number "9" on the zoom ring passes the index line.

Focus

2

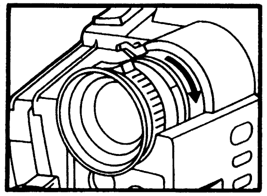


Focus by turning the zoom lever slowly.

- Use the zoom lever to focus in the MACRO range.
- Turning the Zoom ring will slightly alter the angle of view of the lens.
- The zoom and auto-focus mechanisms do not function during macro shooting.

Release MACRO

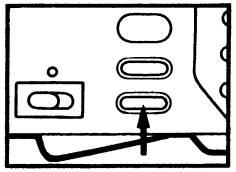
3



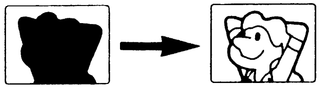
To release the Macro mode, turn the zoom lever in the direction of the arrow until the number "9" passes the index line.

Backlight compensation

- Press the BLC button. While it is being pressed, the iris is 1–2 f-stops wider than that adjusted automatically.



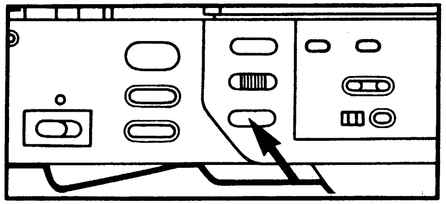
When excessive lighting is located in back of the subject, correct exposure may not be obtainable. To compensate for this, use BLC.



Without BLC With BLC

High-Speed Shutter

The GF-450E is equipped with a selectable high-speed shutter that allows better recording of quick movements for sharp, clear stills or slow-motion playback when using a VCR equipped with clear still or slow-motion functions.



1 Press the SHUTTER button to switch to a desired speed. This can be done while recording or in any other mode. It continues until switched to another.

2 When finished recording the fast-action scene, switch back to the standard shutter speed by pressing the SHUTTER button until STD appears on the LCD.

Notes:
- The High-Speed Shutter mode requires slightly more subject illumination than the Standard Shutter mode. Therefore, the low-light warning may blink in the viewfinder. If so, switch to the Standard Shutter mode.
- "S1000" will be displayed in the viewfinder when the high-speed shutter mode is selected.

Attention:
Picture colour may be adversely affected in the high speed shutter mode when the subject is lit by alternating discharge-type light sources such as fluorescent or mercury-vapor lights.

BGM (Background Music) Audio Mixing

Audio mixing is possible when an audio source is connected to the BGM IN connector.

Connect an external audio component to the BGM IN connector. The resulting sound will be a mixture of the external source and the camera's built-in microphone.
- An external microphone (local or remote) can also be connected to the MIC jack, if you prefer, but this will cancel out the camera's built-in microphone.
- Connecting the optional AV input calbe to connect an audio source to the AV IN/OUT connector also makes sound recording possible.
- Reduce the TV monitor volume or move the microphone farther away from the TV monitor if whistling or howling occurs during sound recording.

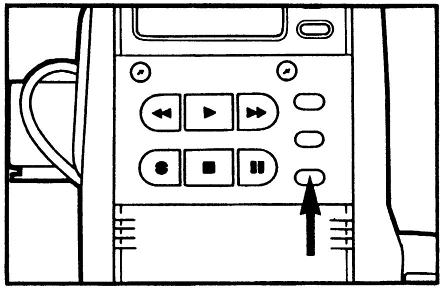
Index code marking

The Index Search function gives you automatic access Search System allows index codes to be placed on recorded tape for convenient dubbing or editing on VCR's with an Index Search function.
Press the VISS button once to put an index code onto the tape. The REC mode indicator blinks during the marking process in the viewfinder. For details, refer to the VCR's instruction manual.

Notes:
- It is not possible to change to another mode during the 2 seconds that the code is being recorded on the tape.
- Indexing is not possible during fading-in or fading-out.

Animation function

Animation produces the illusion of movement in otherwise stationary scenes or objects. This technique is accomplished by shooting a series of slightly different pictures of the same scene or slightly different poses of the same object for a brief period of 1 second or less.



1 Put the unit in the Record standby mode.

2 Press the ANIM button.
- "ANIM 1/4 s" appears on the LCD to show that the camera is set to record for 1/4 of a second.

3 Press the ANIM button again to select the desired interval time. The following series of time intervals are displayed with each press of the button: 1/4S, 1/2S, 1S and continuous mode.

4 Press the Recording Start/Stop button after focusing the camera on a subject.

5 Recording stops automatically in the Record-Pause mode after the selected period of time.

6 Repeat Step 3 for the required number of pictures.

7 Playback the recorded series to check if results were satisfactory.

Notes:
- Keep the camera steady in one position when filming the series of shots for best results. Mounting the camera on a tripod is recommended.
- Release the Animation mode by pressing the ANIM button till the "ANIM" indicator in the LCD disappears, or press the STOP button.
- Add sound later by using the Audio Dubbing function.
- The Animation mode can only be engaged from the Record/Pause mode.
- During an Animation sequence, although the FADER indication will be indicated in the viewfinder when the FADER button is pressed, fading cannot be engaged.
- Animation is not possible when performing insert editing.
- The Animation mode is reset when power is turned off.
- Before recording in the Animation mode at the very beginning of a tape, put the VideoMovie in the Record mode for about 5 seconds in order to get the tape running smoothly. Using the Fade-in function at this point is an ideal way to begin an animated program.

CONNECTION TO A TELEVISION FOR PLAYBACK

With the optional RF converter (RF-V3E), direct playback on a TV not equipped with AV terminals is possible.

The GF-450E includes playback circuits and allows playback of pre-recorded cassettes simply by connecting to a television set.

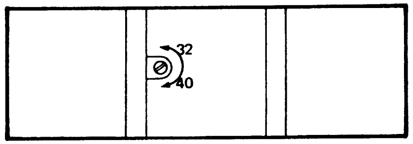
1 Remove the aerial cable from the TV receiver.

2 Connect the aerial cable to the ANTENNA IN terminal of the RF unit.

3 Connect the RF OUT terminal of the RF unit to the aerial terminal of the TV receiver using the provided aerial cable.

4 Connect the VIDEO/AUDIO INPUT cable of the RF unit to the AV IN/OUT connector of the GF-450E

5 Adjust the RF converter output channel according to your VIDEO CHANNEL.

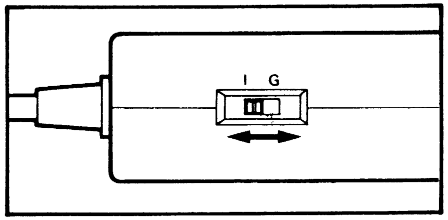


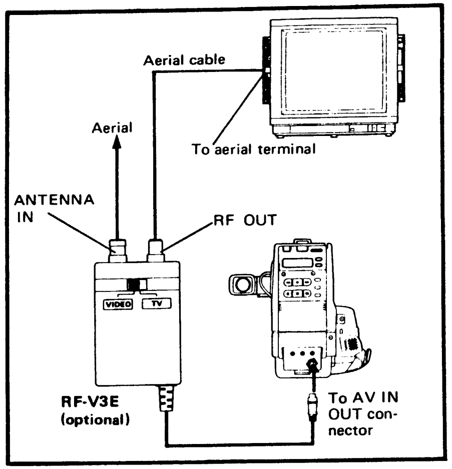
• RF converter channel adjustment screw

The RF unit permits playback of video and audio recordings through a TV receiver. The signals from the RF unit are viewed through a vacant channel not used for broadcasting in your area. The output frequency of the RF converter has been set to correspond to a broadcast on UHF channel 36. To view playback pictures from the GF-450E with your TV receiver, tune its specified AV channel to UHF channel 36. If channel 36 is employed for broadcasting in your area, readjust the RF converter output channel to one of the vacant channels between 32 and 40. To make this adjustment, remove the small cap on the back of the RF unit and turn the adjustment screw with a screwdriver to tune in a vacant channel.

• TV system select switch (I/G)

When you use a TV receiver built to the British PAL standard, shift the system select switch to "I".





• RF converter channel adjusting procedure

1. Set the AV channel of the TV receiver to one of the vacant channels.
2. Power the GF-450E.
3. Put the GF-450E in the Rehearsal mode (see page 11).
4. Set the VIDEO/TV switch of the RF unit to VIDEO.
5. While monitoring the output signal on the TV screen, turn the RF converter channel adjustment screw so that the monitored picture comes in most clearly.

- When you wish to view video cassette programmes, always select the AV channel on the TV receiver which has been tuned to the output frequency of the RF converter.

PRECAUTIONS FOR RF-V3E (optional)
- For exclusive use with the GF-450E VideoMovie.
- Do not disassemble or remodel the RF-V3E.
- Do not expose it to strong shocks.
- Unplug the connected equipment during lightning storms. (Never touch the aerial cable.)

CAUTION:
To view the GF-450E recordings with a TV receiver, use a TV receiver having a specified AV channel and employ this AV channel as your VIDEO CHANNEL, otherwise playback may be disturbed with vibrating or bending pictures. AV channels refer to channels exclusively for video playback; because of AFC circuits applied to these channels, the playback pictures can be stabilised. Recent TV receivers have one or more AV channels.

OPERATION

Viewing video cassettes being played back with the GF-450E.

To view video cassettes or to monitor the recording, set the VIDEO/TV switch of the RF unit to VIDEO and the TV channel selector to the channel corresponding to the RF output channel.

Viewing television programmes

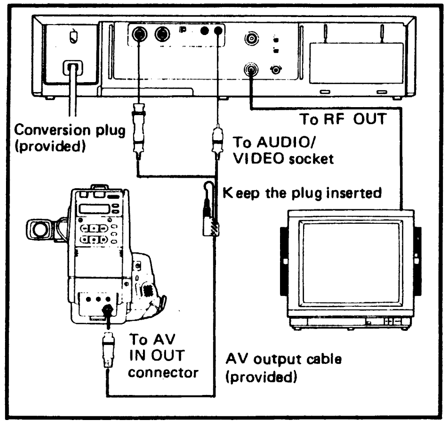
Set the VIDEO/TV switch to TV, and the TV receiver will function as usual.

TAPE DUBBING OR EDITING

Dubbing onto a standard recorder

Connection

1. Connect the AV IN/OUT connector of the GF-450E to the audio and video input connector of the video recorder using the optional dubbing cable.
2. Connect a television to the video recorder to monitor the picture while dubbing.
3. Set the DUBBING ON/OFF switch to ON.



Operation

- Put the GF-450E in the Play mode and the connected recorder in the Record mode to copy the recording. To edit out unwanted material, press the recorder's PAUSE button.

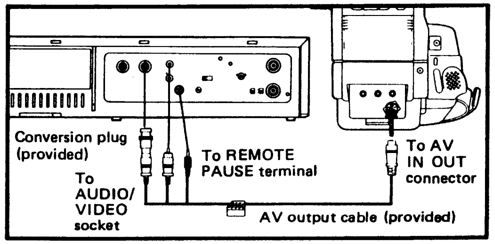
There are some VCR's which are not compatible with master Edit control. For those units, use the VCR's pause control to perform edit-in or edit-out functions.

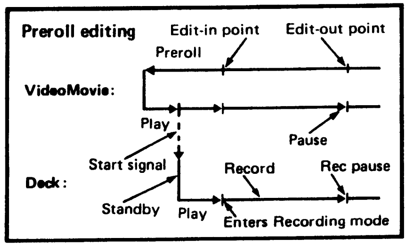
Using the Master Edit Control System

This function is available when using **designated** JVC video decks equipped with a remote pause terminal. The Master Edit Control system allows control of the connected deck using the VideoMovie's controls, preroll editing for edits free of transition-point gaps and distortion.

Connection

1. Connect the AV IN/OUT connector of the GF-450E to the audio and video input connector and remote pause terminal of the video recorder.
2. Connect a television to the video recorder to monitor the picture while dubbing.
3. Set the DUBBING ON/OFF switch to ON.





Operation

Dubbing can be initiated from Stop mode or Still mode.

● For dubbing a tape

1. Switch on the VideoMovie's power.
2. Switch on the deck's power.
3. Put the deck in the Record-Pause mode.
4. Press the EDIT START button to start editing. The tape is loaded, then dubbing starts.
5. Tape stop when the PAUSE/STILL or STOP button of the GF-450E is pressed or counter reaches "0M".
6. Deck stops recording and enters the Record-Pause mode

● For editing

1. Switch on the VideoMovie's power.
2. Turn on the deck's power.
3. Put the deck in the Record-Pause mode.
4. Locate the edit-in point via play, fast-forward, rewind, or Shuttle Search, and press the PAUSE/STILL button.
5. Press the EDIT START button to start editing.
6. Tape stops when the PAUSE/STILL or STOP button of the GF-450E is pressed or counter reaches "0M".
7. Deck stops recording and enters the Record-Pause mode.

Note:

When the EDIT button is pressed from the Still mode, the tape is rewound for 5 seconds of program time. The Play indicator appears on the LCD to indicate rewinding is taking place. After prerolling, first the prerolled section is played back for stabilizing tape run. During playback of the GF-450E, it gives a start signal to the deck standing by in the Record-Pause mode to start playback and then to enter the Recording mode at edit-in point, while the GF-450E continues playback. The Master Edit Control indicator appears on the LCD during dubbing.

Setting the edit-out point using counter memory

In the above procedures, counter memory can be used to set the edit-out point before editing takes place, so that the VideoMovie automatically stops playback at the designated point. If the edit-out point is to be set in this way, do so following step 3 of the dubbing operation.

1. Locate the desired edit-out point on the VideoMovie's tape.
2. Press the VideoMovie's PAUSE/STILL button.
3. Reset the VideoMovie's counter to "0".
4. Press the VideoMovie's counter MEMORY button.
5. The VideoMovie enters the Pause mode, and the deck enters the Record-Pause mode.

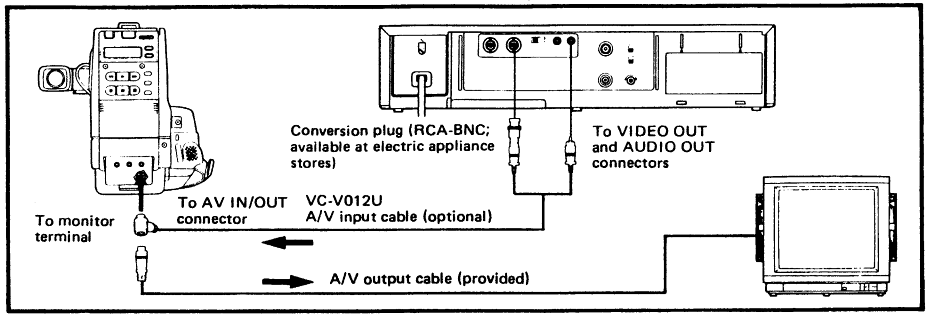
Note:

When the tape reaches the preset edit-out point during the dubbing operation, it may stop slightly before or after the designated point on the tape.

Dubbing from a second recorder

Connection

1. Connect the AV IN/OUT connector of the GF-450E to the AUDIO and VIDEO OUT connectors of the video recorder using the optional VC-V012U A/V input cable.
2. To monitor the picture while dubbing, insert the A/V output cable (or the RF unit's plug, depending on the type of television) into the monitor terminal provided on the plug of the A/V input cable. Viewfinder monitoring is also possible (no mode indication appears).



Conversion plug (RCA-BNC; available at electric appliance stores)
To VIDEO OUT and AUDIO OUT connectors
To AV IN/OUT connector
VC-V012U A/V input cable (optional)
To monitor terminal
A/V output cable (provided)

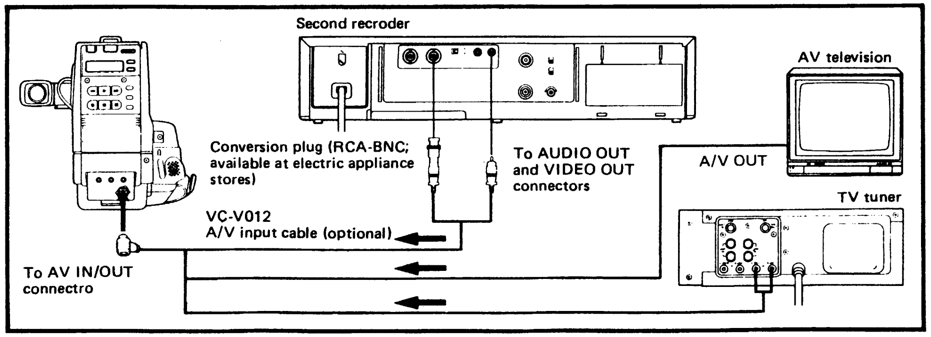
Operation

- When the A/V input cable is plugged into the AV connector of the GF-450E, the external source mode is automatically engaged.
- Put the video recorder in the Play mode and the GF-450E in the Record mode; pressing the REC Standby button engages the Recording Standby mode. Press the Play button to start recording.
- To edit out unwanted material, press the PAUSE/STILL button.

TV PROGRAM RECORDING

Connection

Connect the AV IN/OUT connector of the GF-450E to the AUDIO and VIDEO OUT connectors of an AV television, a second recorder or a TV tuner using the optional VC-V012U A/V input cable.



Second recroder
AV television
Conversion plug (RCA-BNC; available at electric appliance stores)
To AUDIO OUT and VIDEO OUT connectors
A/V OUT
TV tuner
VC-V012 A/V input cable (optional)
To AV IN/OUT connectro

Operation

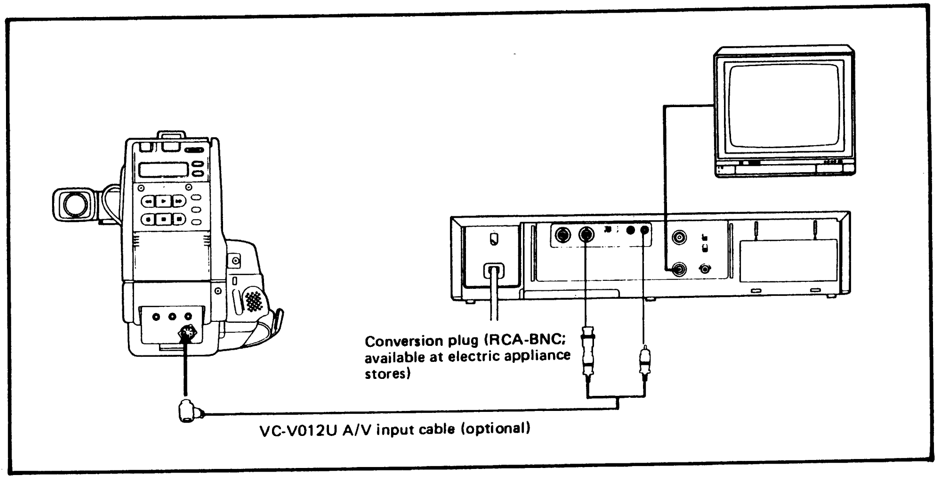
- The external source mode is automatically engaged.
- Tune the AV television, video recorder or the TV tuner to a desired channel and put the GF-450E in the Record mode by pressing the REC Standby button and then the PLAY button.
- Viewfinder monitoring is possible (no mode indication appears).

Insert Editing

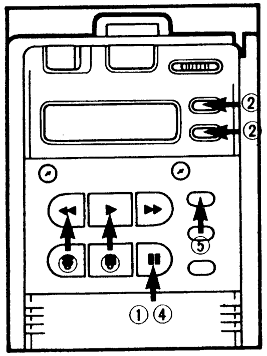
Insert editing means recording a new scene into a section of prerecorded tape so that a part of the original recording can be replaced with a new sequence without excessive picture distortion at the edit-in and edit-out points.

Preparation

- Connect the GF-450E and the video sources according to the diagram shown below.
- Turn on the power of the GF-450E and connected component.
- Correctly insert the appropriate cassette into the GF-450E.



Conversion plug (RCA-BNC; available at electric appliance stores)
VC-V012U A/V input cable (optional)

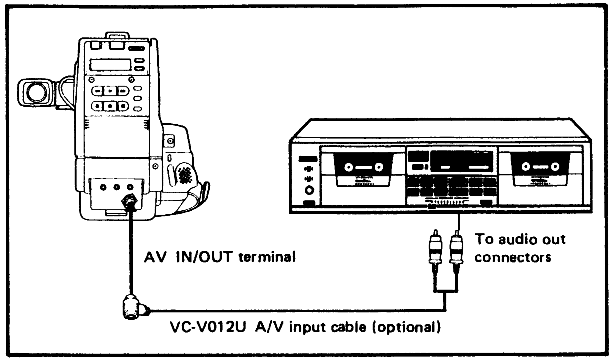


1. Locate the desired edit-out point on the VideoMovie's tape and press PAUSE/STILL.
2. Press RESET to obtain a "0" reading, then press MEMORY to obtain an "M" indication on the LCD.
3. Press REW/SHUTTLE SEARCH to rewind the tape a little beyond the beginning of the scene you wish to insert.
4. Press PAUSE/STILL exactly at the beginning of the scene you wish to insert.
5. While holding INSERT pressed, press PAUSE/STILL. The INSERT indicator lights and the VideoMovie enters the Insert Edit mode with the scene to be inserted appearing on the screen for monitoring.
6. Press PLAY to insert the new sequence. It is recommended to press PLAY only after the picture has become stable.
7. When the counter reading of "0" is reached, insert editing stops automatically and the VideoMovie enters the Play mode.

Note:
- Animation function cannot be engaged while insert editing is performed.

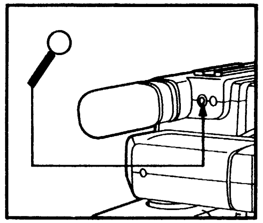
Audio Dubbing

Audio dubbing means recording a new soundtrack on a pre-recorded tape, i.e., replacing the original sound with new audio material.



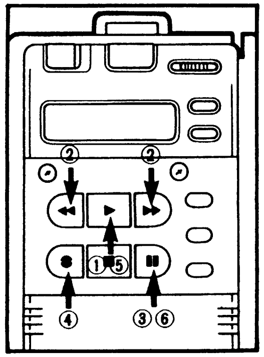
Preparations

- ●Correctly insert the tape you wish to audio dub.
- ●Connect the mike or an audio component as shown below.



Precautions

- ●Tapes with their safety tabs removed cannot be audio dubbed. Reseal the safety tab slot to perform the dubbing.
- ●If whistling or howling is heard during audio dubbing, reduce the TV volume or move the mike farther away from the TV.
- ●When dubbing from an audio component . . .
  Connect the audio component's audio out connectors to the VideoMovie's AV IN/OUT terminal as shown above.
- ●When dubbing from mikes . . .
  Connect mikes to the VideoMovie as shown on the left.
- ●Dubbing from both a connected audio component and mike will result in a mixed-sound recording.



1 Press PLAY to start playback of the tape.

2 Press REW/SHUTTLE SEARCH and FF/SHUTTLE SEARCH to locate more quickly the place on the tape where you want audio dubbing to begin.

3 Press PAUSE/STILL at the exact beginning point for audio dubbing.

4 While pressing AUDIO DUB, press PAUSE/STILL to enter the Audio Dub Standby mode.

5 When you are ready with the new audio material, press PLAY to begin audio dubbing.

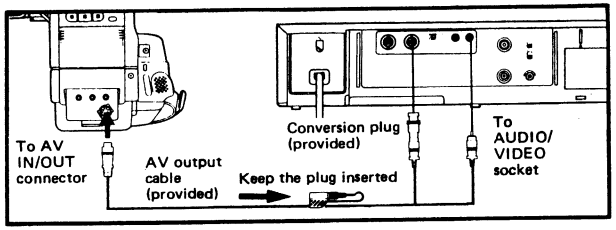
6 To stop audio dubbing, press PAUSE/STILL to engage the Audio Dub Pause mode, or press STOP.

USING THE GF-450E AS A VIDEO CAMERA

For continuous documentation of longer events, the GF-450E can be used as an independent video camera in combination with either a deck-type or portable video recorder.

Using a recorder not equipped with a remote pause terminal

●Connect the AV IN/OUT connector of the GF-450E to the audio and video input connector of the video recorder using the optional dubbing cable.



Operation

1. Press the RECORD button while keeping the STOP button pressed. The camera output signal is now available via the dubbing cable.
2. Put the connected recorder in the Record mode. Recording will start. Tape start/stop should be controlled with the recorder's buttons.

Note:

●In this configuration, it is possible to obtain a continuous recording and an edited-out recording of the same event simultaneously, because the GF-450E's start/stop button only controls the tape inside itself while another tape loaded in the connected recorder continues running. To record on the GF-450E's tape, follow the same recording procedure as mentioned before: press REC standby and then the start/stop button.

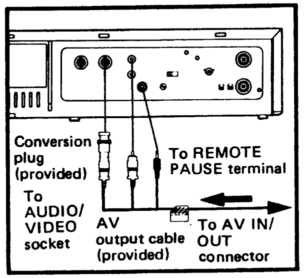
Using a designated JVC VCR equipped with a remote pause terminal or with a 10-pin camera connector

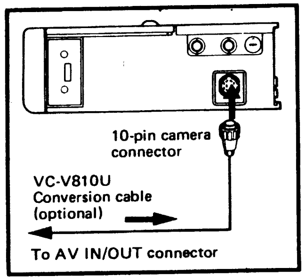
For a recorder with a remote pause terminal

●Connect the AV IN/OUT connector of the GF-450E to the audio and video input connector and remotre pause terminal of the video recorder using the optional dubbing cable.

For a recorder with a 10-pin camera connector

●Connect the AV IN/OUT connector of the GF-450E to the 10-pin camera connector of the second recorder using the optional VC-V810U conversion cable.





Operation

1. Press the RECORD button while keeping the STOP button pressed.
2. Press the connected recorder in the Recording Standby (Record-Pause) mode.
   - ●The viewfinder's mode indication corresponds to the state of the connected recorder.
3. Press the start/stop button of the GF-450E to start recording.

Note:

●To record on the GF-450E's tape as well, press the REC standby button and then the start/stop button.

Precautions

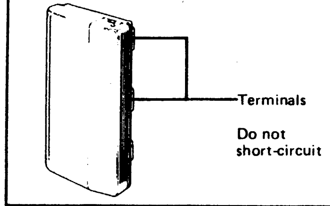
- ●Power is not supplied to the GF-450E from the connected VCR. Independent power supply is required for both the GF-450E and the VCR.
- ●If you stop recording by pressing the GF-450E's start/stop button, the connected VCR also stops in the Pause mode. However, the pause command signal is not delivered to the connected VCR in the following cases and, therefore, the VCR will start automatically:
  (1) when the GF-450E is switched off or its battery becomes discharged.
  (2) when the VC-V810U cable is disconnected.
  Therefore, before replacing the battery or tape for the GF-450E, put the connected VCR either in the STOP or REC LOCK mode.

CHARGING THE BATTERY PACK

To charge the battery pack, use the exclusive AC power adapter/battery charger AA-V5EG (provided) or car battery charger BH-V5E (optional).

A WORD ON THE EXCLUSIVE BN-V5GU/V6GU/V7GU BATTERY PACKS

The BN-V5GU/V6GU/V7GU are nickel-cadminum batteries. Give attention to the following to make the most of their characteristics.



Temperature ranges:
The recharging time is based on room temperature of 20°C.
The lower the temperature, the longer the recharging time.

For charging: 10°C to 35°C
For operating: 0°C to 40°C
For storing: -10°C to 30°C

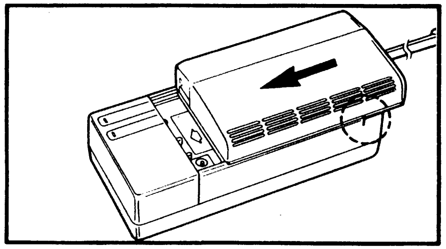
The battery pack has been kept in the uncharged state for shipment. Therefore, before use, charge it.
BE SURE TO CAREFULLY READ THE CAUTION ATTACHED TO THE BATTERY PACK.

Charging procedure

Charging time

BN-V5GU 50 min.	BN-V6GU 70 min.
BN-V7GU 80 min.	

- The charging time differs depending on the ambient temperature and the condition of the battery pack.



1 Connect the AC power cord to a wall outlet. (The POWER indicator will light.)

2 Align the marks on the battery pack and adapter.

3 Slide the battery pack in the direction of the arrow until it locks in place.

4 When charging is completed, the CHARGE indicator goes out.

PRECAUTIONS

- If used near a radio, the provided AA-V5EG AC power adapter/battery charger may interfere with reception.
- Prevent inflammables, water and metallic objects from entering the unit.
- Do not disassemble or modify the unit.
- Do not apply shocks to the unit.
- Do not subject the unit to direct sunlight.
- Avoid using the unit in extremely hot or humid places.
- Avoid using the unit in places subject to vibrations.

Note:
The optional BH-V5E Car Battery Charger can charge the batteries from a car battery. For details refer the instructions of the BH-V5E.

Recording time for the GF-450E

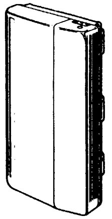
BN-V5GU 25 min.	BN-V6GU 50 min.
BN-V7GU 80 min.	

- The recording time per charge is influenced by the duration of recording standby, frequency of zooming, etc. It is safer to have spare battery packs.

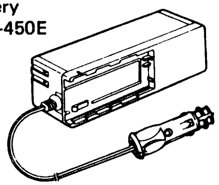
SYSTEMS FLEXIBILITY

For maximum enhoyment, make the most of the provided or optional accessories depending on the situation.

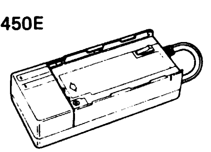
- **Regular battery pack BN-V5GU**
  ☞ **Page 28**
- **High-capacity battery pack BN-V6GU**
  ☞ **Page 28**
- **Super-high-capacity battery pack BN-V7GU**
  ☞ **Page 28**



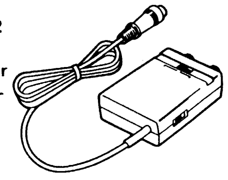
- **Car battery charger BH-V5E**
  ☞ **Pages 5 and 28**
  Use to charge the battery pack, or power the GF-450E using a car battery.



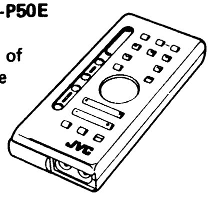
- **AC power adapter/battery charger AA-V5EG**
  ☞ **Pages 5 and 28**
  Use to power the GF-450E with household AC current or charge the battery pack.



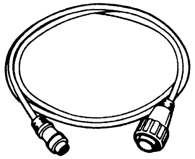
- **RF unit RF-V3E**
  ☞ **Pages 21 and 22**
  Use to connect the GF-450E to a regular TV receiver for playback.



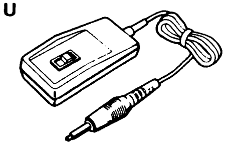
- **Character generator CG-P50E**
  ☞ **Page 31**
  Allows superimposition of titles, dates and lap time during recording.



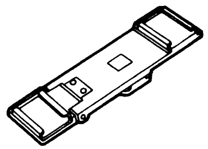
- **Conversion cable VC-V810U**
  ☞ **Page 27**
  For connecting the GF-450E to a JVC VCR with a 10-pin camera connector.



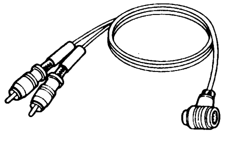
- **Remote control unit RM-P1U**
  ☞ **Page 31**
  Controls recording start/stop from a distance.



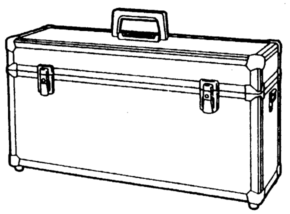
- **Shoe adapter CU-V410U**
  ☞ **Page 31**
  Use to attach microphone, character generator etc.



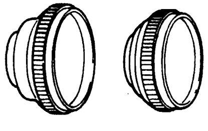
- **A/V input cable VC-V012U**
  ☞ **Page 24**
  Use to connect the GF-450E to a television set equipped with audio/video output connectors for recording, or to a second video recorder for dubbing.



- **Carrying case CB-V300U**
  Use to carry the GF-450E together with accessories.

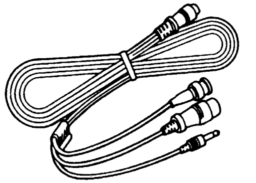


- **Conversion lens kit GL-V157U**
  For a change of perspective attach the teleconversion lens 1.5 X to boost the Telephoto power 1.5 times or the Wide conversion lens for wide-angle coverage.

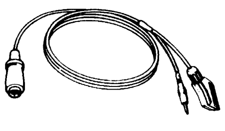


AV dubbing cables
For connecting VCRs which do not accept the VC-V826E, these cables are also optionally available.

- **AV dubbing cable VC-V856E**



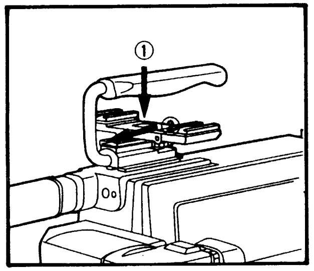
- **AV output cable VC-V896E**



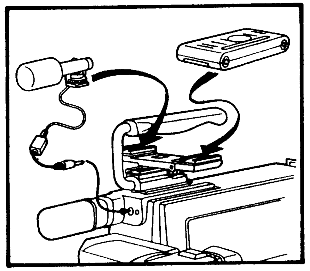
Choose the appropriate cable depending on the type of VCR you have.

SHOE ADAPTER (optional)/ CARRYING HANDLE (optional)

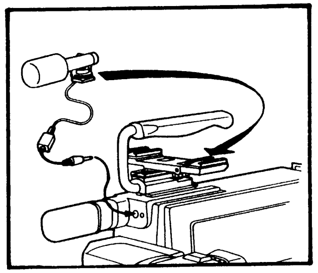
Attaching external microphone using shoe adapter.



Attaching character generator using shoe adapter.



Attaching character generator and external microphone using shoe adapter and carrying handle.



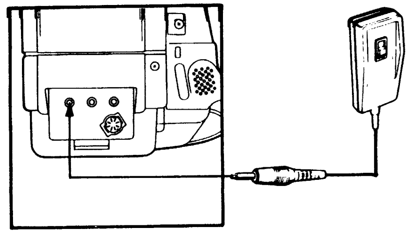
CAUTION
- Do not attach a video light, its heat could cause malfunctioning of the GF-450E.

Notes:
- Do not adjust the viewfinder angle while using shoe adapter.
- Keep carrying handle in up position while attaching accessories.
- Run the microphone cord behind the shoe adapter.

REMOTE CONTROL UNIT (optional)

The remote control unit RM-P1U (optional) permits recording start/stop to be controlled from a distance.

1



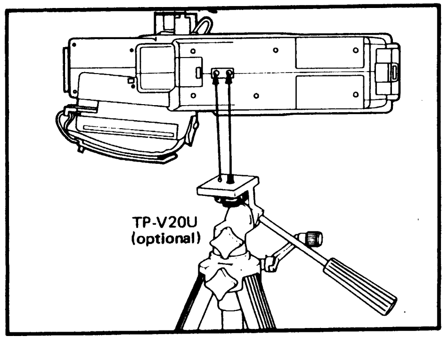
Plug the remote control cable into the REMOTE connector.

2 Press the standby button to engage the Recording Standby mode.

3 To start recording, set the remote control's switch to REC; to stop temporarily, set it to PAUSE.

Note:
Fader will not function when remote control unit is connected.

TRIPOD MOUNTING



Align the screw and camera direction stud of the tripod with the camera's tripod mounting socket and stud hole, and firmly tighten the screw.

SUPPLEMENTAL INFORMATION

What is "colour temperature"?

Light is composed of various colour components in different proportions. A relationship exists between the temperature of a light source and the colour components of the emitted light; as the temperature rises, the colour of the light varies from red, orange, yellow, white to blue in that order. "Colour temperature" is a value that expresses differences in colour among light sources, measured in Kelvin degrees. Bluish light has a higher colour temperature than reddish light.

What is "white balance"?

Making the colours look natural on TV is what white balance is all about. Because a camera is not as adaptable as the human eye, if a light source is reddish, white subjects in that light are recorded as reddish. White balance adjustment is performed to compensate for colour temperature variations of light so that whites are reproduced as white. Correct white balance makes all other colours correct. The GF-450E can perform automatic white balance adjustment in the full-auto mode. However, if illumination is insufficient, white balance adjustment cannot be performed. To obtain correct colours, therefore, sufficient illumination is essential.

What is "illuminance"?

"Illuminance" (also called 'luminance') is the intensity or brightness of light, expressed in lux. The GF-450E is designed to provide best pictures under the conditions of a 700-lux illuminance, although shooting is possible all the way down to 10 lux. To obtain good pictures in very bright light, the use of an ND (neutral density) filter is recommended. (See chart on this page.)

How to get good colour pictures

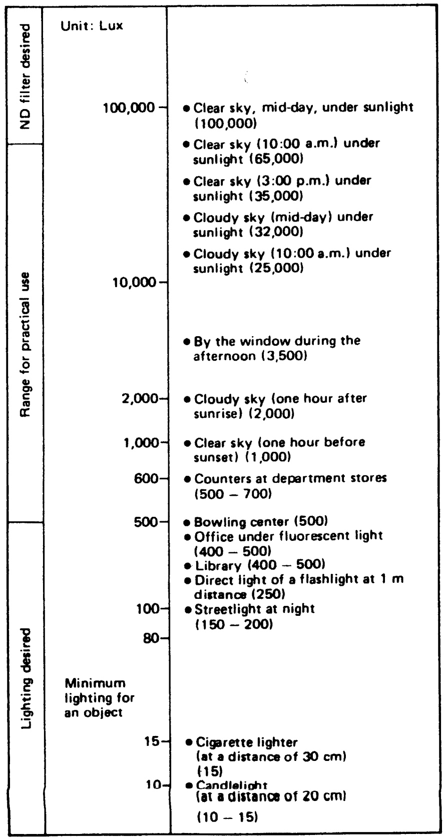
The simplest way is to provide sufficient lighting (close to the camera's reference illuminance) and accurately adjust the camera to the colour temperature of that lighting. If light sources of different colour temperatures are used together, accurate white balance adjustment is very difficult. For example, if natural light is mixed with artificial light, which is likely to occur next to windows, correct colours of the subject are difficult to obtain. It is recommended in such cases that curtains in the room be closed to shut out light from outside. Also, when artificial lighting devices are used, they should all have the same colour temperature. For example, it is recommended that incandescent or halogen lamps not be used together with fluorescent lighting.

Colour temperatures of various artificial lighting

Type of illumination		Colour temperature
Tungsten lamp for home use		2800 K
Tungsten lamp for photographic use		3200 K
Quartz-halogen lamp		
Blue lamp for photographic use		5000 K
Fluorescent lamp	Warm white	3500 K
	White	4500 K
	Daylight type	6500 K

Illuminance chart

- The values on this chart are approximated to give you a rough reference.



IN CASE OF DIFFICULTY

What may initially appear to be trouble is not always a real problem. Make sure first . . . .

Symptoms	Check points
Power	
No power is supplied.	●Is the battery pack correctly installed? ●Is the battery pack charged? ●Is the power supply unit correctly connected? ●Is the POWER switch of the connected AC adapter set to ON?
Recording	
Recording is impossible.	●Check to see if the cassette safety tab is in place. See page 3.
Picture colours greatly differ from actual subject colours	●If in the manual white balance mode, check the setting of the 💡/▭/☀ button.
No sound is recorded with an external microphone.	●Is the microphone's switch set to ON?
Recording does not start.	●Have you pressed the RECORD standby button first?
Playback	
Tape is running, but no playback picture appears.	●Is the VIDEO/TV switch of the RF unit set to VIDEO? ●Is the TV receiver set to your video channel?
Noise bars appear in the playback picture.	●Use the TRACKING control to reduce noise bars.
Playback picture is blurred or interrupted while TV programmes received are clear.	●Video heads may be dirty or worn out. For head cleaning or replacement, consult the nearest JVC dealer.
Tape transport	
Tape stops during fast forward or rewind.	●Is the "M" indication visible in the tape counter? If so, press the MEMORY button to cancel the memory function.
Rewinding or fast forwarding is impossible.	●Check to see if the tape has already been fully wound on one reel or the other.
Other	
No function is available with more than two mode indicators lit.	●If this should happen when using power supply units other than the battery pack, turn their POWER switch on and off. With a battery pack, replace it with another charged one.
Vertical white lines appear when shooting a very bright object.	●This may occur when the background contrasts very much with the object. This is normal.

The GF-450E is a microcomputer-controlled device. External noise and interference might prevent it from functioning properly. In such cases, first disconnect its power supply unit (battery pack, AC power adapter, etc.); and then reconnect it and proceed as usual from the beginning.

SECTION 1
SERVICE CAUTION AND DISASSEMBLY

1.1 PRECAUTIONS

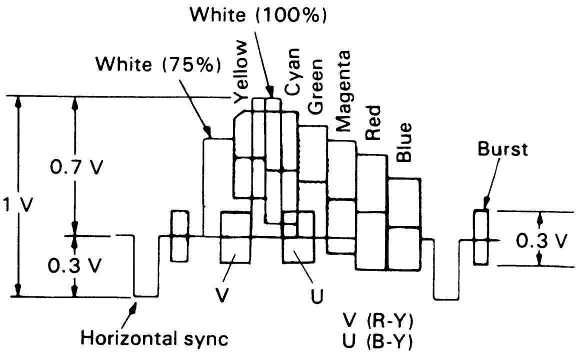
1. Disconnect unit from power before removing or soldering components.
2. When removing a fastener (screw, washer, etc.), be careful not to drop it into the mechanism. If a fastener should be dropped, be sure to retrieve it.
3. When removing a connector, pay enough attention to flexible wires and every wiring not do damage them.
4. Some resistors, shorting jumpers (0 ohm resistance), ceramic capacitors and diodes are chip parts. These chip parts cannot be reused after they are once removed. Refer to Section 1.3.
5. Electrical adjustments are required after replacing circuit components and certain mechanical parts. It is important to perform these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available. Especially, when turn the VR of the camera portion without permission, the whole steps to adjust all VRs may be required.
6. When removing and fitting together parts, be careful not to damage or displace other parts. (Be especially careful with the video head ass'y and the tape transport mechanism.)
7. Pay enough attention to the CCD image sensor and optical filter so that they won't be dusty, soiled or damaged. It it is soiled with fingerprints, etc., clean gently with silicon lens tissue or chamois.
8. When fitting and wiring an IC, be careful not to damage circuit patterns.

1.2 TEST EQUIPMENT AND TOOLS REQUIRED FOR ADJUSTMENTS

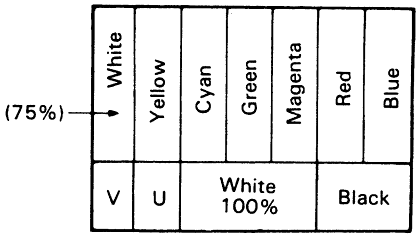
For correct measurement and proper adjustment, prepare the following test equipment and tools besides general-purpose tools.

1.2.1 Required test equipment and tools

1. Color video monitor
2. Blank tape for recording and playback
3. AC power adapter (AA-V5EG or equivalent)
4. Oscilloscope (dual-trace type, more than 20 MHz)
5. Frequency counter
6. Audio tester
7. Vectorscope
8. General tools such as precision screwdrivers, tweezers, hex. wrenches, soldering iron, etc.
9. Halogen lamps
10.

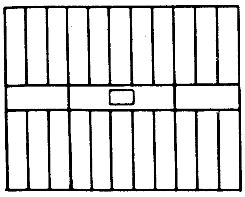
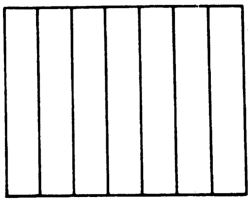
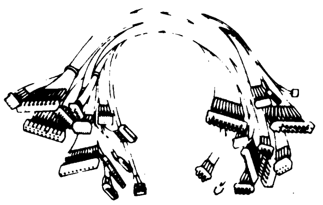
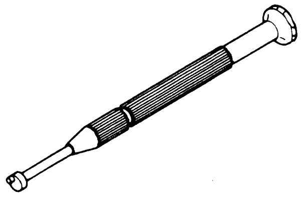
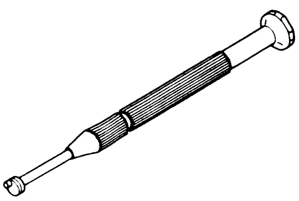
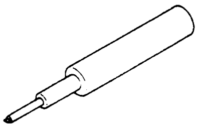
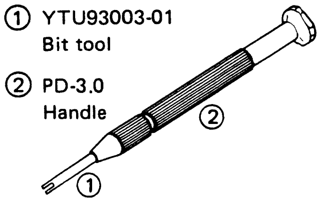
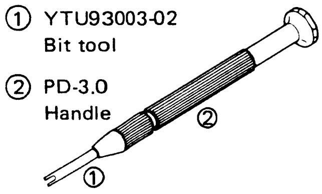
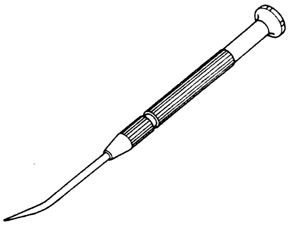
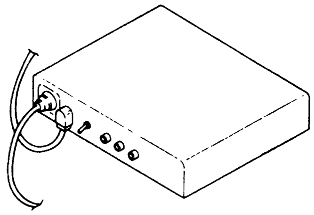
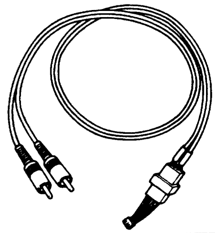
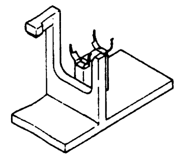
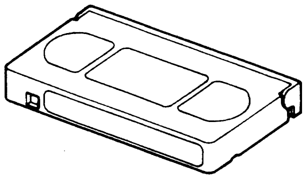
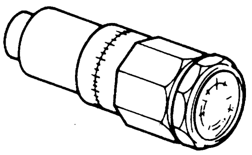
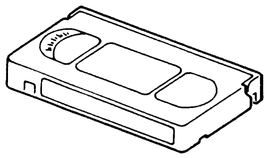
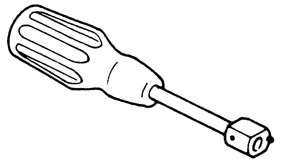
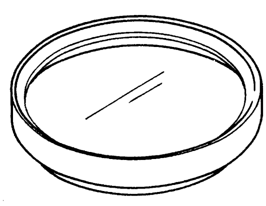
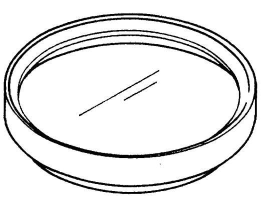


Waveform of color bars signal



Color bar pattern

1.2.2 Special test equipment and tools required for adjustments

Grey scale pattern (GS-2A) Reflection type, 11 steps, $\gamma = 2.2$	Color base pattern (CC-2A) Reflection type, 7-color	Patching cord YTU93011B	Back focus asjustment handle PUJ37186A
			
Auto focus unit Bacj focus adjustment handle PUJ37186B	Auto focus unit Back focus adjustment chart PUJ93944	Adjustment jig compact VTR YTU93004	Chip parts replacement jig ass'y YTU93003A
			
Chip parts replacement jig ass'y YTU93003B	Chip IC replacing tool PTS40844	Y/C separator PUJ25579-2	Y/C separator tool YTU93006
 			
Camera adjust stand YTU93010A	Alignment tape MH-2	Torque gauge assembly PUJ48075-2	Back tension cassette gauge PUJ48076-2
			
A/C head position tool PUJ47351-2	Color temperature conversion filter (PUJ53340A-C2,C4,C8,W2,W4,W8)	Neutral density filter (PUJ53341A - ND2, ND4, ND8)	Color compensating filter - CC10Y (CC10Y filter made by Kodak)
			This filter is CC10Y in Kodak

1.3 REPLACEMENT OF CHIP PARTS

For replacing chip parts, proceed it as follows.
Use a well insulated fine-tipped soldering iron (approx. 17 W, 130°C ~ 260°C in temp.). It is recommended to use a soldering iron with solder absorber (55 W approx.) for convenience.

1. Soldering cautions:
   1) Do not apply heat for more than 3 seconds.
   2) Avoid using a rubbing stroke when soldering.
   3) Discard removed chips; do not reuse them.
   4) Supplementary cementing is not required.
   5) Use care not to scratch or otherwise damage the chips.

2. Soldering conditions:
   1) Resistors, capacitors, etc.

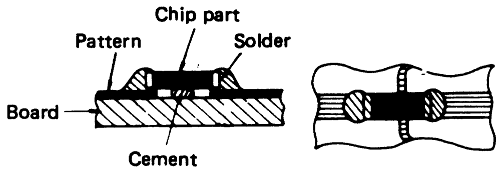


Fig. 1-3-1

   2) Transistors, diodes, etc.

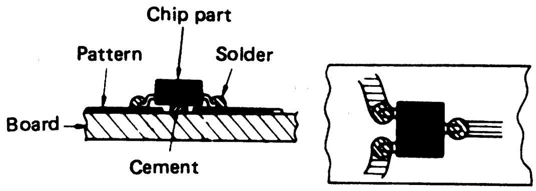


Fig. 1-3-2

3. Removal (resistors, capacitors, etc.):
   1) Grasp the part with repair jig and melt the solder at one side.

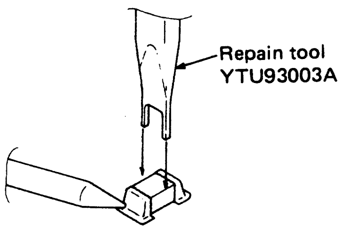


Fig. 1-3-3

   2) Melt the solder at the other side and remove the part with a twisting motion.

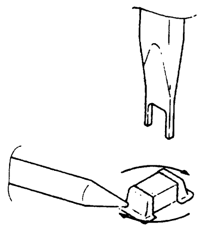


Fig. 1-3-4

4. Removal (transistors, diodes, etc.):
   1) Melt the solder of one lead.

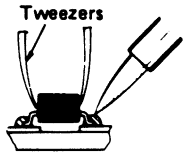


Fig. 1-3-4

   2) Lift the side of that lead upward.

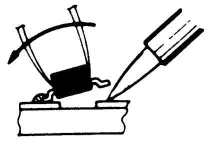


Fig. 1-3-5

   3) Simultaneously heat solder of the two remaining leads and lift part to remove.

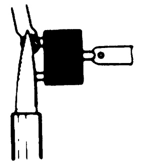


Fig. 1-3-6

5. Preheating (except for semiconductors):
   Immediately before installing new resistors or capacitors, use a blower type hair dryer and preheat the part for about two minutes at approximately 150°C.

6. Replacement:
   1) Presolder the contact points of the circuit pattern.

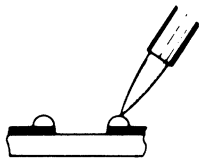


Fig. 1-3-7

   2) Press the part downward with repair jig and apply the soldering pencil as indicated in the figure.

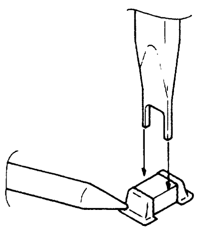


Fig. 1-3-8

1.4 REMOVING OF FLAT ICs

1. For removing solder chips from IC's pins, use a solder remover or a wiry solder absorber.
2. Moving the chip IC replacing jig around tips of the IC, heat tips and leads for removing the IC.
3. Do not reuse the removed IC and discard it.

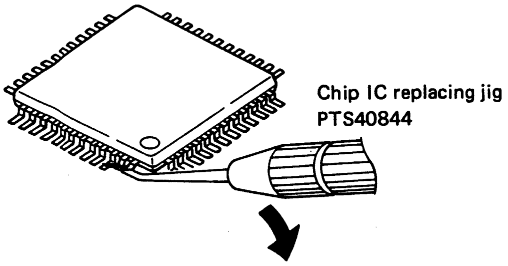

Chip IC replacing jig
PTS40844

Fig. 1-4-1

1.5 DISASSEMBLY

1.5.1 Cassette cover

1. Remove two screws ① securing the cassette cover. Then lift the cassette cover in direction Ⓐ to remove it.

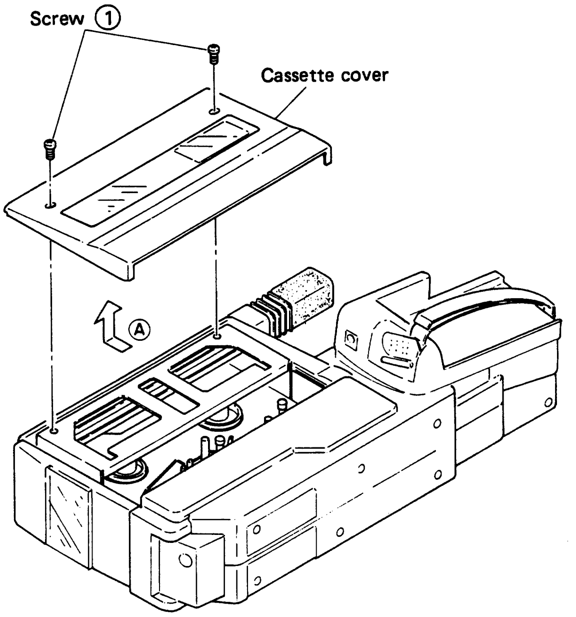

Screw ①
Cassette cover
Ⓐ

Fig. 1-5-1

1.5.2 Front cover

1. Remove four screws ②, ③ and ④ shown in Fig. 1-5-2 to remove the front cover.

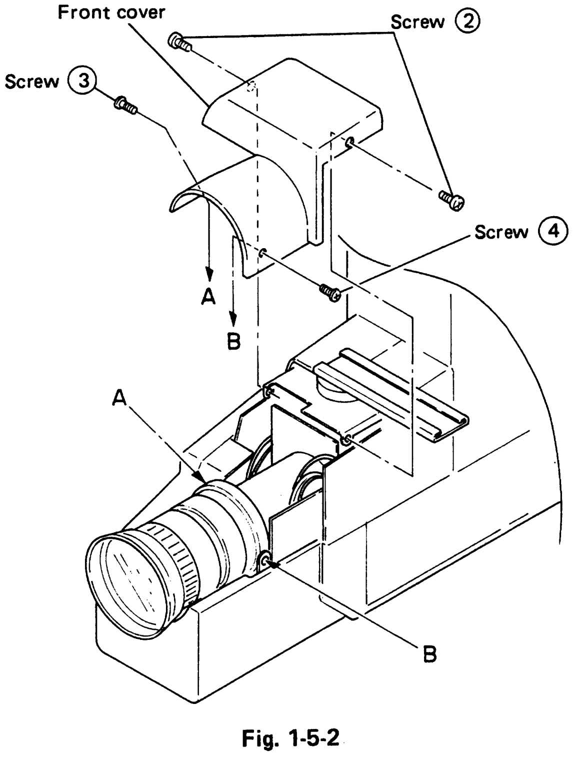

Front cover
Screw ②
Screw ③
Screw ④
A
B
A
B

Fig. 1-5-2

1.5.3 Battery base and Upper case

1. Remove six screws ⑤, ⑥, ⑦ and ⑧ shown in Fig. 1-5-3 (A).
2. Remove four screws ⑨. Raise the battery base and take out four screws ⑩, ⑪, ⑫, ⑬. (Fig. 1-5-3(B))
3. Raise the upper case. Disengage two connectors ⓐ and remove the upper case and battery base. (Fig. 1-5-3(B))

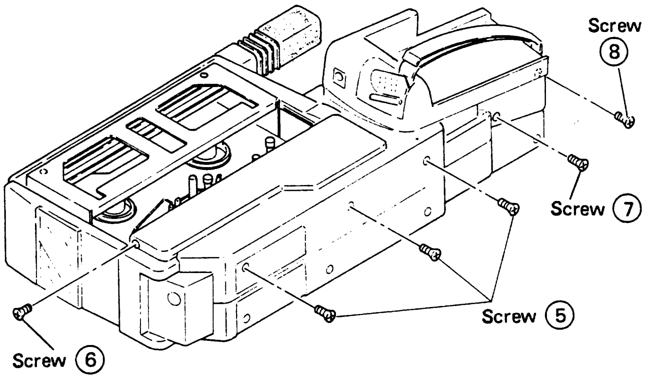

Screw ⑧
Screw ⑦
Screw ⑤
Screw ⑥

Fig. 1-5-3(A)

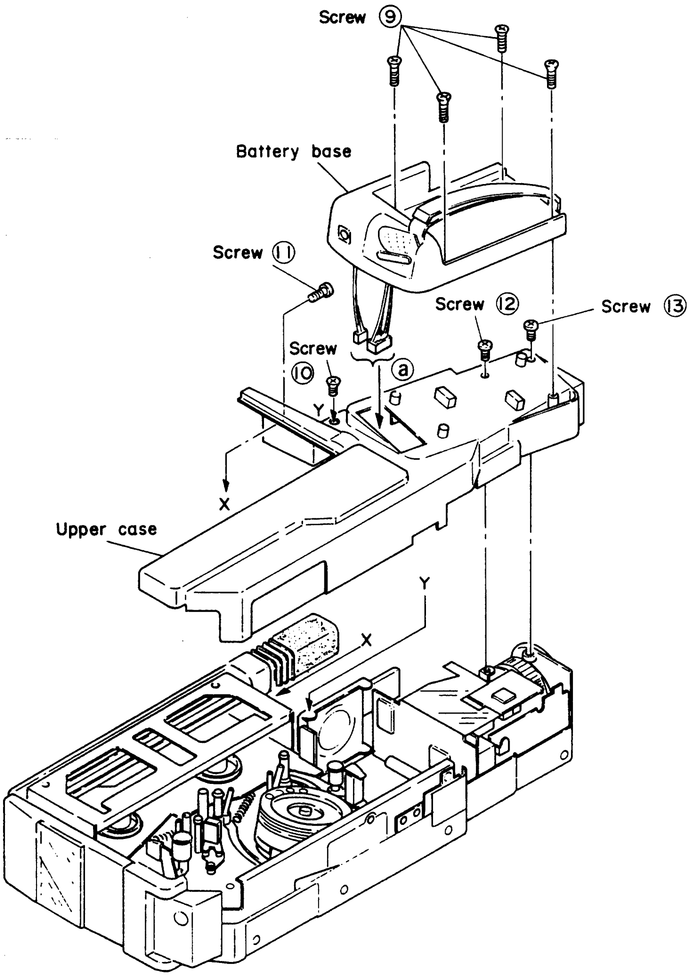

Screw ⑨
Battery base
Screw ⑪
Screw ⑫
Screw ⑬
Screw ⑩
ⓐ
Y
X
Upper case
Y
X

Fig. 1-5-3(B)

1.5.4 Camera section

1. Remove three screws ⑭, ⑮ and ⑯ shown in Fig. 1-5-4 to remove front panel and camera section.

Note: Use caution in the area of the two flexible wires ⓐ and six connecting wires Ⓑ, ⓒ to remove the lower case and camera section.

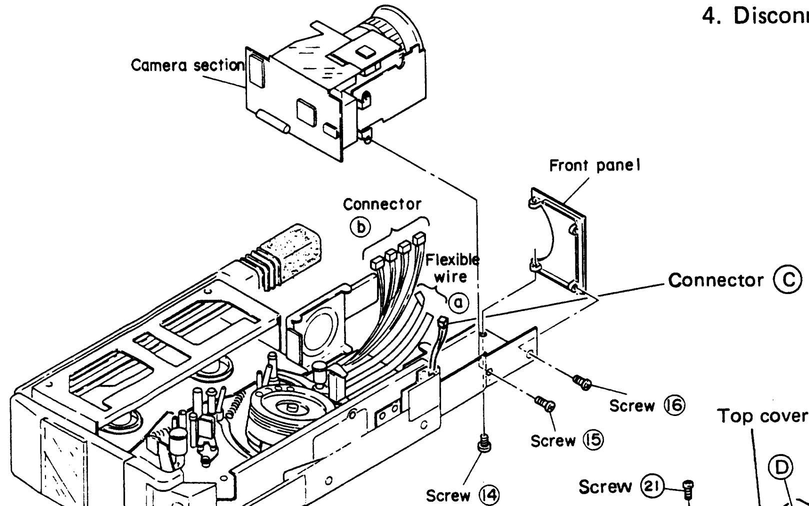

Camera section
Front panel
Connector
ⓑ
Flexible wire
ⓐ
Connector Ⓒ
Screw ⑯
Screw ⑮
Screw ⑭

Fig. 1-5-4

1.5.5 Deck section (Fig. 1-5-5)

1. Remove five screws ⑰, ⑱, ⑲ and then disconnect three connectors Ⓐ, Ⓑ, Ⓒ to remove operation unit.
2. Remove two screws ⑳, ㉑ and then disconnect connector Ⓓ to remove the top cover.
3. Remove five screws ㉒, ㉓, ㉔ and then disconnect two flexible wires ⓑ, ⓒ to remove the deck section.
4. Disconnect connector Ⓗ from 02 VIDEO board CN6.

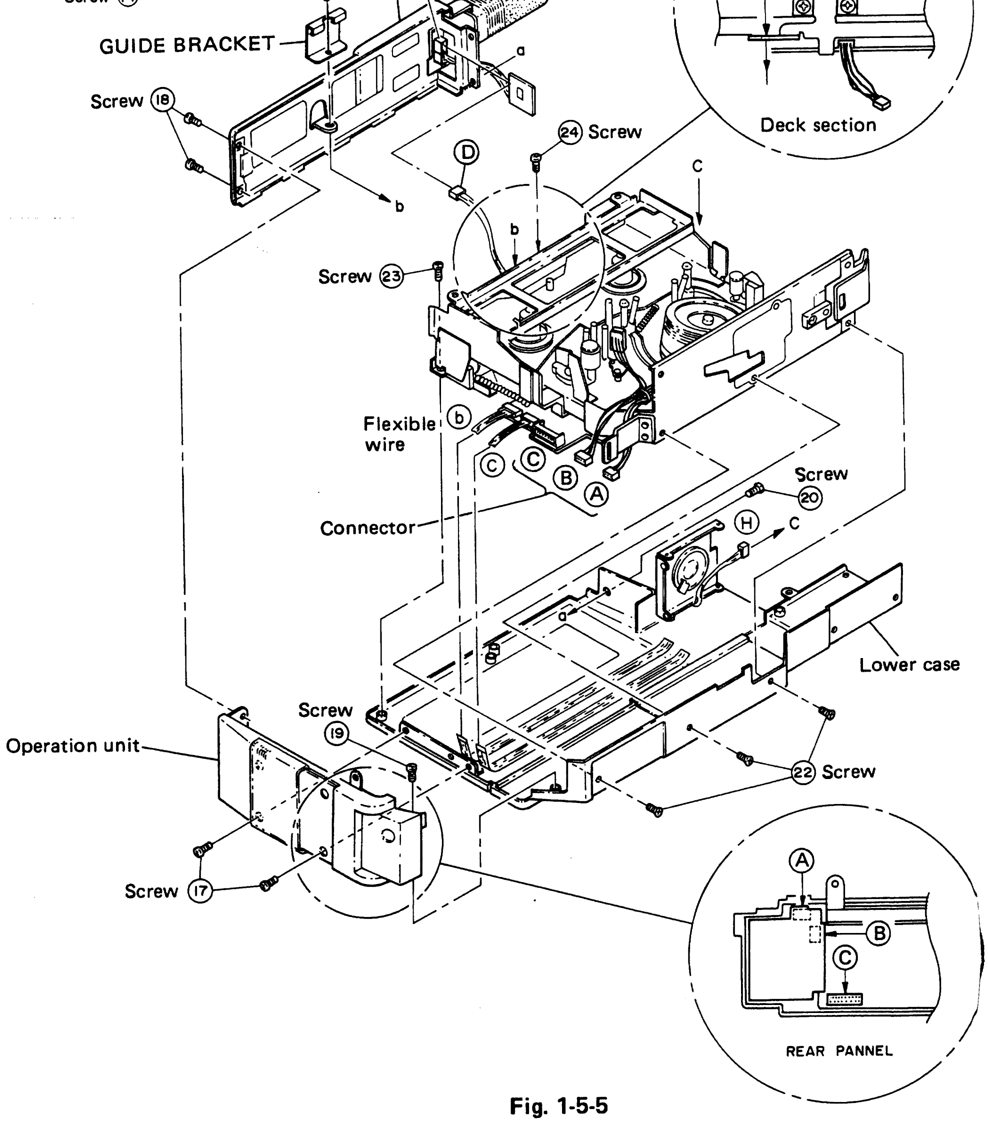

Top cover
Ⓓ
Screw ㉑
GUIDE BRACKET
a
Screw ⑱
b
㉔
b
Deck section
㉔ Screw
Ⓓ
c
b
Screw ㉓
Flexible wire
ⓑ
ⓒ
Ⓒ
Ⓑ
Ⓐ
Connector
Screw
⑳
Ⓗ
c
a
Lower case
Screw
⑲
Operation unit
㉒ Screw
Screw ⑰
Ⓐ
Ⓑ
Ⓒ
REAR PANNEL

Fig. 1-5-5

1.6 REMOVAL OF CIRCUIT BOARDS

1.6.1 Deck section

1. Remove two screws ①, ② and then disconnect connector Ⓐ in Fig. 1-6-1 to remove MIC1 and MIC2 boards.

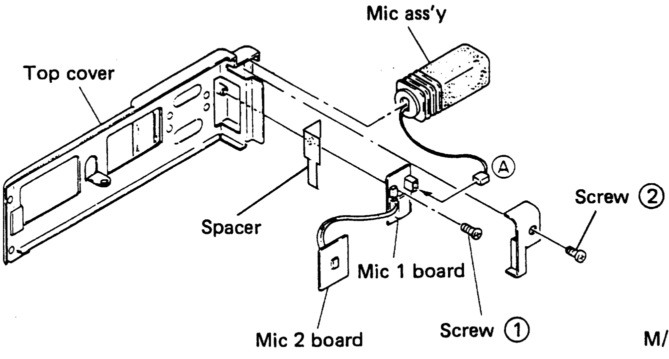

Mic ass'y
Top cover
Ⓐ
Screw ②
Spacer
Mic 1 board
Mic 2 board
Screw ①

Fig. 1-6-1

2. Remove three screws ③, ④ and then disconnect seven connectors Ⓒ, Ⓓ, Ⓔ, Ⓕ, Ⓧ, Ⓨ, Ⓩ and flexible wire ⓐ to remove the M/S/A board and Video board. (Fig. 1-6-2)
3. Remove a screw⑤ and then disconnect three connectors Ⓖ, Ⓗ, Ⓘ to remove the MDA board. (Fig. 1-6-2)
4. The wire comes off the clamp wire and disconnect seven connectors Ⓙ, Ⓚ, Ⓛ, Ⓜ, Ⓝ, Ⓞ, Ⓟ and remove a screw ⑥ to remove the M. INTERFACE board. (Fig. 1-6-2)

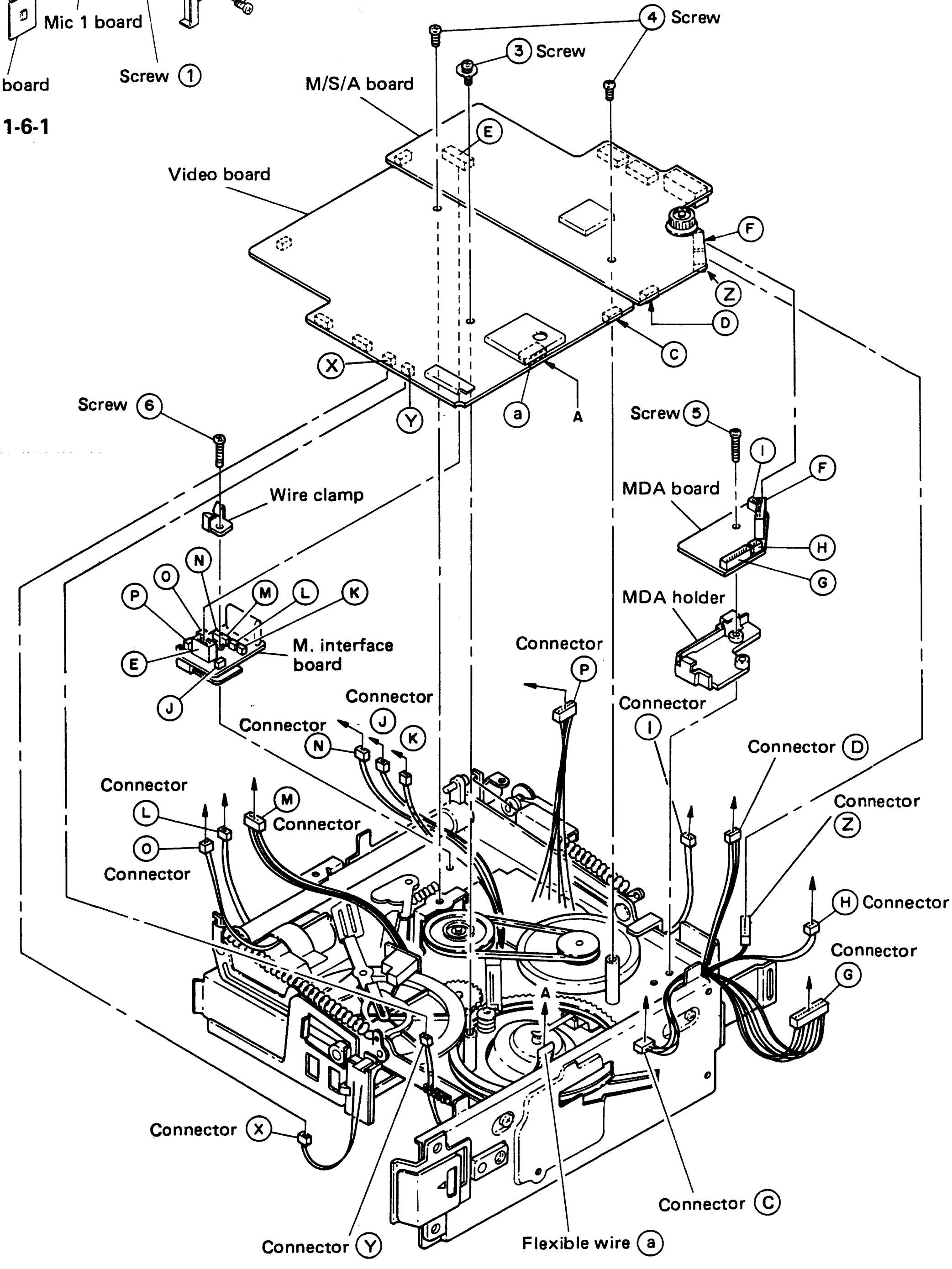

④ Screw
③ Screw
M/S/A board
Ⓔ
Video board
Ⓕ
Ⓩ
Ⓓ
Ⓒ
Ⓧ
Ⓨ
ⓐ
A
Screw ⑥
Screw⑤
Ⓘ
Ⓕ
MDA board
Ⓗ
Ⓖ
MDA holder
Wire clamp
Ⓝ
Ⓞ
Ⓟ
Ⓜ
Ⓛ
Ⓚ
M. interface board
Ⓔ
Ⓙ
Connector Ⓟ
Connector Ⓙ
Connector Ⓝ
Ⓚ
Connector Ⓘ
Connector Ⓓ
Connector Ⓛ
Ⓜ Connector
Ⓞ Connector
Connector Ⓩ
Ⓗ Connector
Connector Ⓖ
A
Connector Ⓧ
Connector Ⓒ
Connector Ⓨ
Flexible wire ⓐ

Fig. 1-6-2

1.6.2 Camera section

1. See Fig. 1-6-3.
   Remove two screws Ⓐ securing the VIDEO-1 board first, and remove two screws Ⓑ securing the FAW board. At this time, pay careful attention to the two washers Ⓒ tightened together with not to mis or drop them.
   As all boards except the VIDEO-1 board are wired with connectors each other, connectors between the camera section and the IND board/ENC board can be disengaged by drawing out the boards sidewards.
2. Carefully draw out the connector Ⓓ of the IND board since it is directly connected with the VIDEO boards. Next, disconnect the connector Ⓔ to remove the IND board.
3. Disconnect connectors Ⓖ and Ⓗ connected directly with the VIDEO-1 board as shown in Fig. 1-6-3.
   The ENC board can be removed by disconnecting connectors Ⓘ and Ⓙ.
4. To remove the VIDEO-2 board, remove two screws securing the DC-DC converter (refer to the "Optical Block Assembly") and the converter from the camera section first since the VIDEO-2 board is directly connected to the VIDEO-1 board with the connectors.

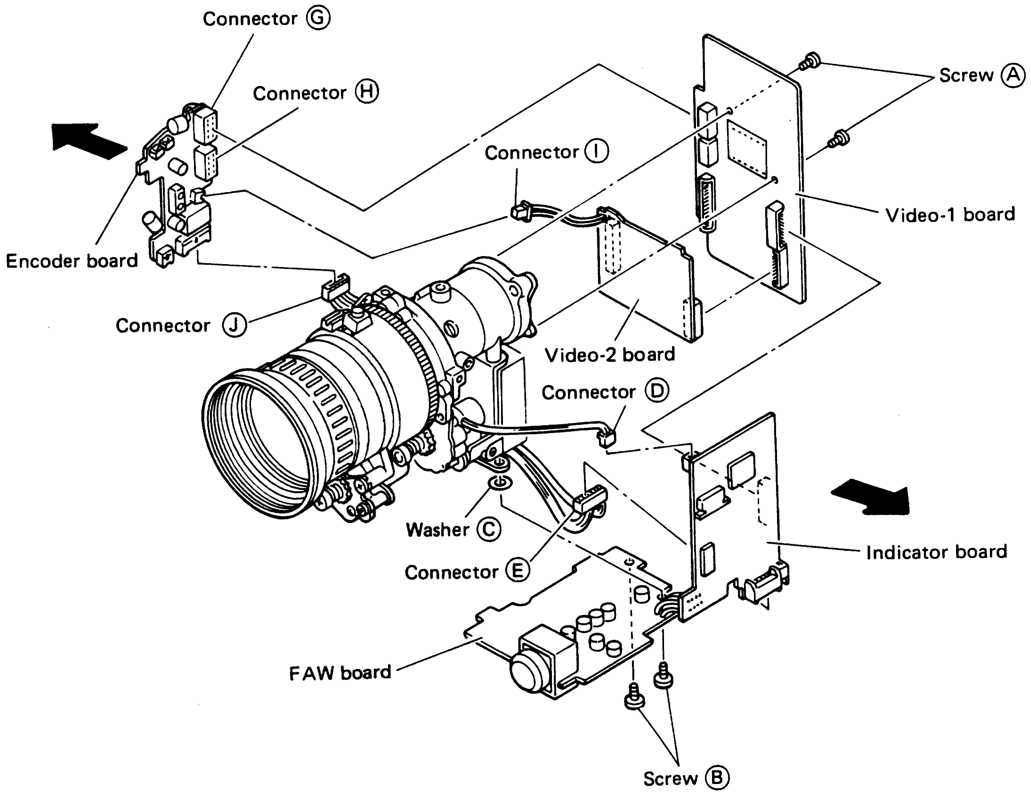

Connector Ⓖ
Connector Ⓗ
Screw Ⓐ
Connector Ⓘ
Video-1 board
Encoder board
Connector Ⓙ
Video-2 board
Connector Ⓓ
Indicator board
Washer Ⓒ
Connector Ⓔ
FAW board
Screw Ⓑ

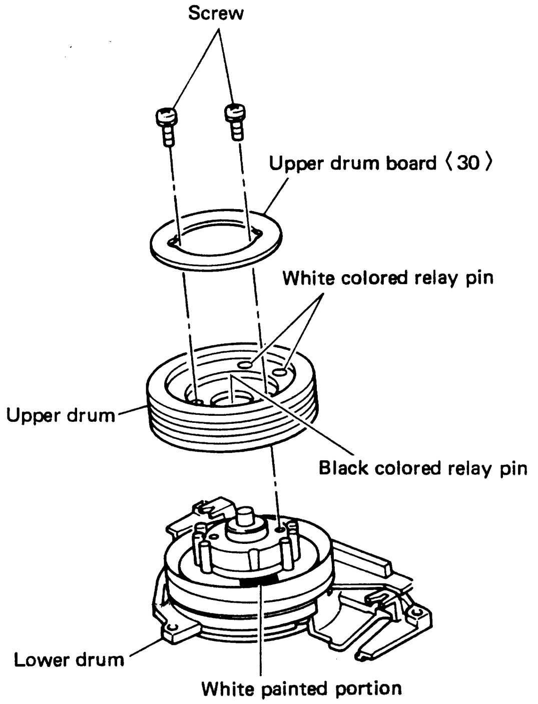
Fig. 1-6-3

1.7 MAIN ASSEMBLY REPLACEMENT

1.7.1 Upper drum assembly

1. Removal

1) Use a desoldering tool or desoldering braid to unsolder the upper drum boards.
2) Take out two screws (2) and raise the upper drum to remove it together with the upper drum board. (If this drum is to be reinstalled, use care not to touch or damage the heads.)



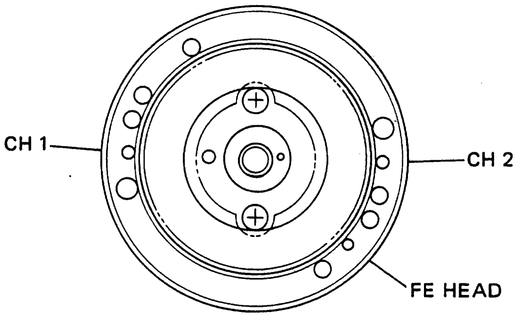
Screw
Upper drum board ⟨30⟩
White colored relay pin
Upper drum
Black colored relay pin
Lower drum
White painted portion

Fig. 1-7-1

2. Installation

Note: When installing the new upper drum, use care not to touch the video heads. If heads are soiled, clean with a soft, finely woven cotton cloth or chamois that has been moistened in alcohol. Hold lightly against the heads and turn the drum clockwise. By no means clean with a vertical stroke.

1) Refer to Fig. 1-7-1. Align the black relay pin of the new upper drum with the white marking of the lower drum.
2) Reinsert screws (2) and tighten them in a balanced manner.
3) Reinstall and solder the upper drum boards.
4) Clean the drum assemblies (see above note).



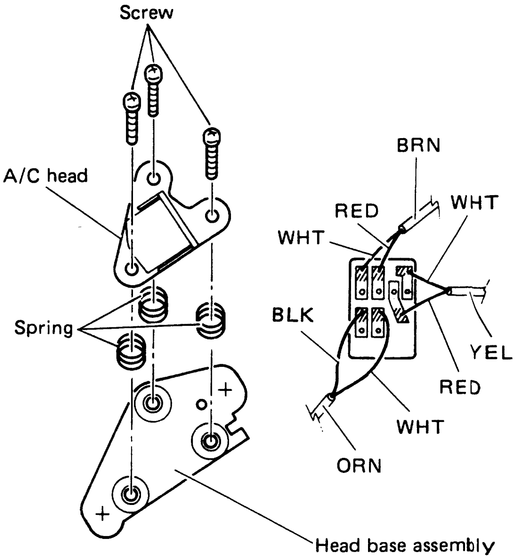
CH 1
CH 2
FE HEAD

Fig. 1-7-2

1.7.2 A/C head (audio/control head)

1. Removal

1) Take out three screws, then remove the A/C head. Use care regarding springs. Do not lose them.
2) Unsolder wires from the A/C head.

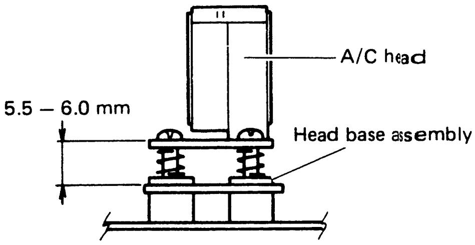


Screw
A/C head
Spring
BRN
RED
WHT
WHT
BLK
YEL
RED
WHT
ORN
Head base assembly

Fig. 1-7-3 A/C head

2. Installation

1) Mount a new A/C head on the head base assembly by reversing the removal procedure as shown in Fig. 1-7-3.
2) Perform rough-adjustment of A/C head height as shown in Fig. 1-7-4.



A/C head
5.5 – 6.0 mm
Head base assembly

Fig. 1-7-4 A/C head height

3. Confirmation and adjustment

1) Use a recording tape and perform interchangeability adjustment. Refer to section 2.3.3.
2) Perform overall confirmation of the Audio circuit. Refer to section 2. 5.

1.7.3 Tension band assembly

1. Removal
1) Take out a screw, then pull out the A portion of the tension band assembly to separate it from the tension pole assembly.
2) Move the FF brake assembly to free the tension band assembly, then remove the tension band assembly from the supply reel disk.

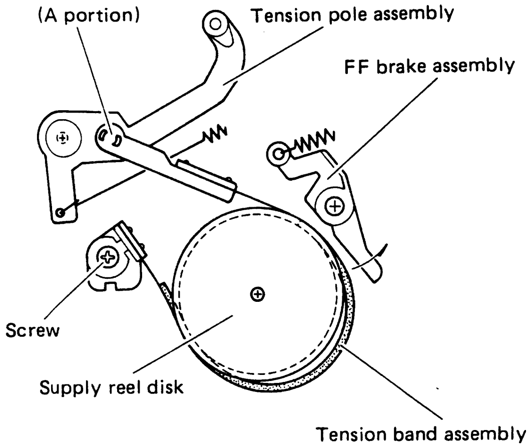

(A portion)
Tension pole assembly
FF brake assembly
Screw
Supply reel disk
Tension band assembly

Fig. 1-7-5 Tension band assembly

2. Installation
1) Install a new tension band assembly by reversing the removal procedure.
3. Confirmation and adjustment
1) Perform the tension pole position adjustment. Refer to section 2.3.1.

1.8 ASSEMBLY PROCEDURE OF MECHANISM

The mechanism of this model is mostly engaged to the mechanism control circuit, through the mode sensor. Therefore, the relation between the mode sensor and the control cam decides all mechanical movement of the mechanical parts such as levers, gears, rollers and so on. If these parts are not properly positioned, the unit will be compulsorily stopped. This will result in damage of mechanical or electrical parts.

1.8.1 Relation between loading rings and connect gears

1. Mount the TU loading ring and connect gear (1) normally, then position them as shown in Fig. 1-8-1.
2. Set the SUP loading ring to position its triangle marking at the center of the pole of the loading gear unit, and adjust the position of the TU loading ring so that its holes coincide with those of the SUP loading ring. Keeping these correlative positions, set the connect gear (2) to gear with the loading rings.

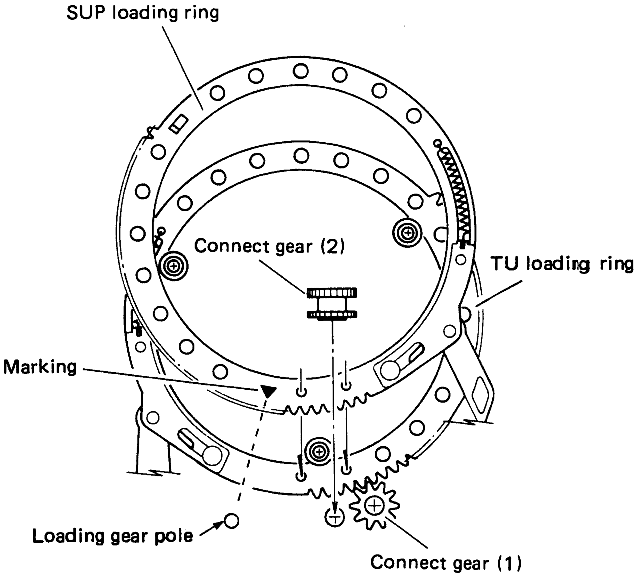

SUP loading ring
Connect gear (2)
TU loading ring
Marking
Loading gear pole
Connect gear (1)

Fig. 1-8-1 Loading ring/connect gear

1.8.2 Installation of the loading gear unit

1. Install the loading gear unit so that the boss of the loading gear unit faces the marking of the SUP loading ring.

   Note: No gear portion of the loading gear unit is toward right.

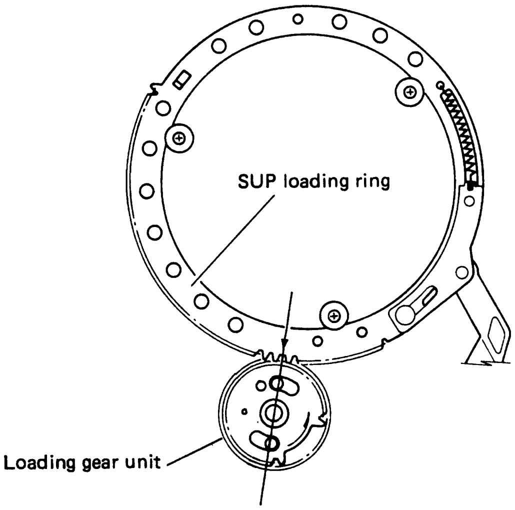


Fig. 1-8-2 SUP loading ring/loading gear unit

1.8.3 Installation of the control cam and cam lever (3)

1. Before insallation of the control cam and cam laver (3), turn gears in the opposite direcions so that the holes overlap each other, then insert screw (M 2.0) into the holes.

   Note: Remove this screw after complate setting if the control cam.
2. Shift the lock plate in the arrow direction to lock it. In this condition, the cassette housing lifts up.
3. Turn the cam lever (2) counter-clockwise fully.
4. Move the pinch roller plate to the utmost extent in the direction of the arrow mark (to the leftmost limit in the figure).
5. Then install the control cam so that the largest triangle mark of the control cam faces toward the center of the loading gear unit.
6. Turn the mode motor by hand, confirm that the control cam is able to rotate counter-clockwise.
7. Take out the screw from the loading gear unit.

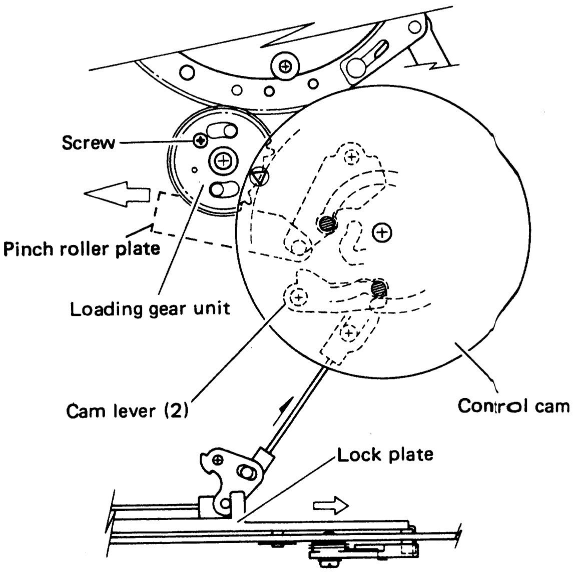


Fig. 1-8-3 Installation of control cam

8. Turn the mode motor by hand to rotate thecontrol cam counter-clockwise, then set the cam lever (3) correctly as shown in Fig. 1-8-4.

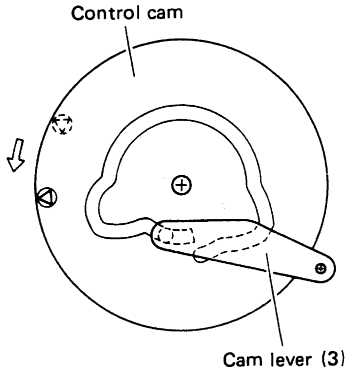


Fig. 1-8-4 Control cam/cam lever (3)

1.9 REPLACEMENT OF IMAGE SENSOR

1.9.1 Precautions

1. When replacing the CCD image sensor, make sure to grounding it by soldering and so on since its characteristic against electrostatic breakdown is weaker than C-MOS LSIs.
2. Pay enough attention to the transparent glass and optical filter of the CCD image sensor so that it won't be dusty, soiled or damaged. If it is soiled with fingerprints, etc., clean gently with silicon lens tissue, chamois, etc.
3. An orange protector seal was applied to the transparent glass of CCD image sensors before shipment. When replacing, do not remove it just before assembling it to the optical block.
4. When soldering the CCD image sensor to the board, do it as fast as possible. If it takes a considerable long time, it causes discoloration of the optical filter by excessive heat.

1.9.2 Removal of CCD image sensor

1. Remove two screws Ⓑ fixing the VIDEO-1 board and the CCD image sensor and unsolder the latter first, and then draw out the CCD image sensor in the direction of the arrow mark to separate it from the VIDEO-1 board.
2. Remove three screws securing the filter holder Ⓒ, and remove the optical LPF Ⓓ and the rubber Ⓔ for the removal.

1.9.3 Installation of CCD image sensor

1. Remove the protector seal of a CCD image sensor Ⓖ and set it on the imager holder Ⓕ first, and then, assemble the space rubber Ⓔ, optical filter Ⓓ, and the filter holder Ⓗ in the above order as piling up them. At this stage, make sure not to missetting the CCD image sensor and imager holder in wrong direction. The optical filter Ⓓ should be placed with its white marking facing downwards and to the lens section.
   After that, fix the filter holder to the imager holder Ⓕ with three screws Ⓒ.
2. Paying attention to the direction, fix the imager holder Ⓕ to the optical block with two screws Ⓐ.
3. Carefully insert the CCD image sensor's pins which protrude from the imager holder Ⓕ into the jacks of the VIDEO-1 board, and then secure the board with two screws Ⓑ.
4. Solder the pins of the CCD image sensor to the VIDEO-1 board. At this time, use care to avoid overheating.
5. Set the lens to MACRO. Confirm absence of vignetting at the image corners. If absent, the picture angle and centering are acceptable.

1.9.4 Adjustment

1. For correcting picture's center and diagonal image, loosen two screws Ⓑ of the VIDEO-1 board and move the whole of the board back and forth.
2. Perform back focus adjustment.
3. Electrical adjustment is not necessary.

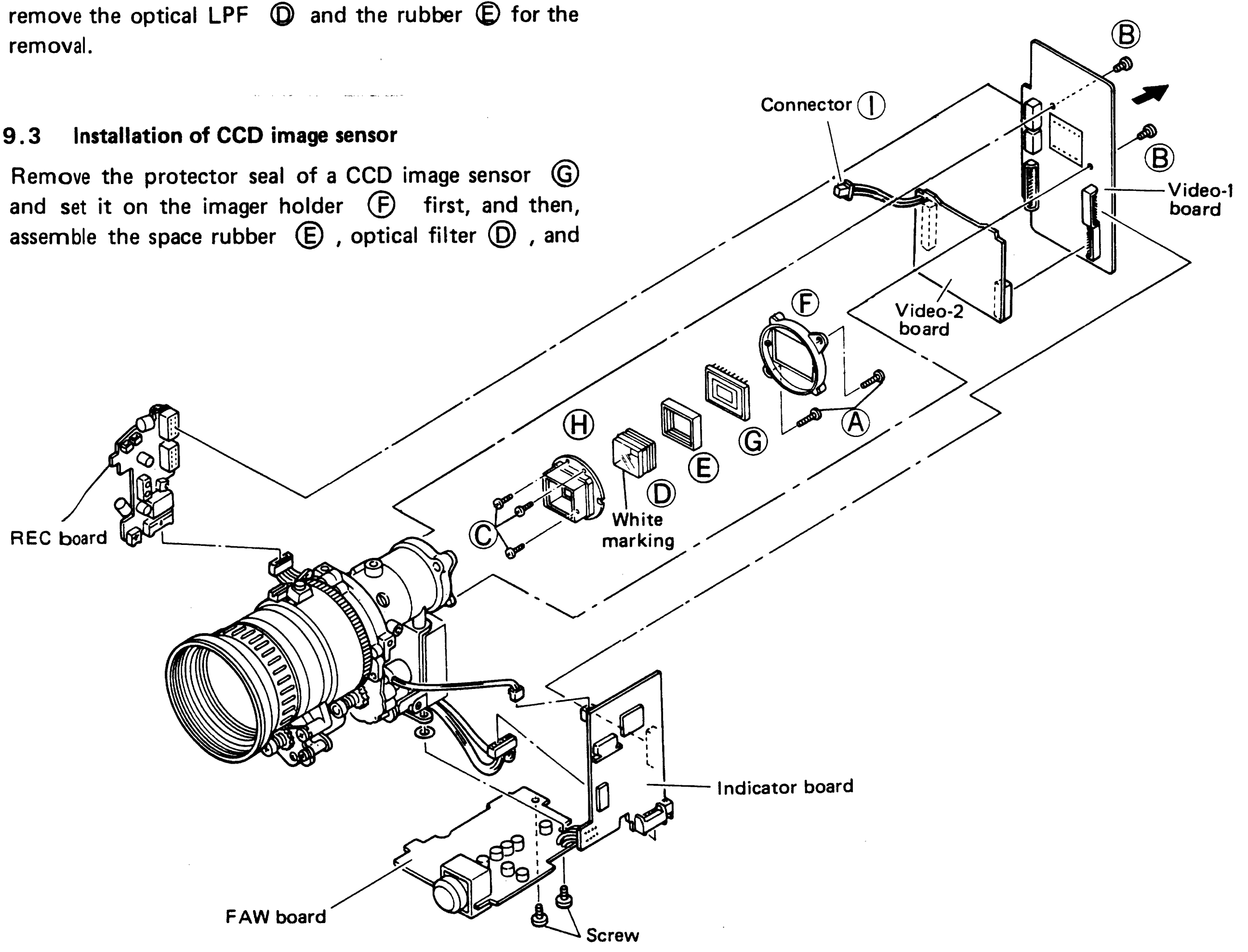


Fig. 1-9-1

1.9.5 Replacement of AF unit

- **Removal procedure**

1. Separate the camera section from the deck section, and remove the two screws Ⓐ.
2. Unsolder IC1 (CCD) on the VIDEO-1 board.
3. Draw out the INDICATOR board and ENCODER board which are directly connected to the VIDEO-1 board in the direction of arrow marks respectively.
4. The camera and deck sections can be separated by drawing out the VIDEO-1 board from the CCD in the direction of the arrow shown in Fig. 1-9-2.
5. The DC-DC converter can be removed by removing the two screws Ⓑ securing the converter (see Fig. 1-9-3).
6. Remove the two screws Ⓒ and one screw Ⓓ securing the AF (auto focus) unit to remove it from the camera section.

   Note: At removal of the screw Ⓓ, make sure not to miss a washer between the AF unit and the camera section.
7. Disconnect the 2-pin and 6-pin connectors of the AF unit to separate it from the camera section.
8. When fitting the camera section with a new AF unit, first set the interlocking pin of the AF unit into the grooved rail on the focus ring and then tighten the two screws Ⓒ in front of the AF unit (see Fig. 1-9-3).

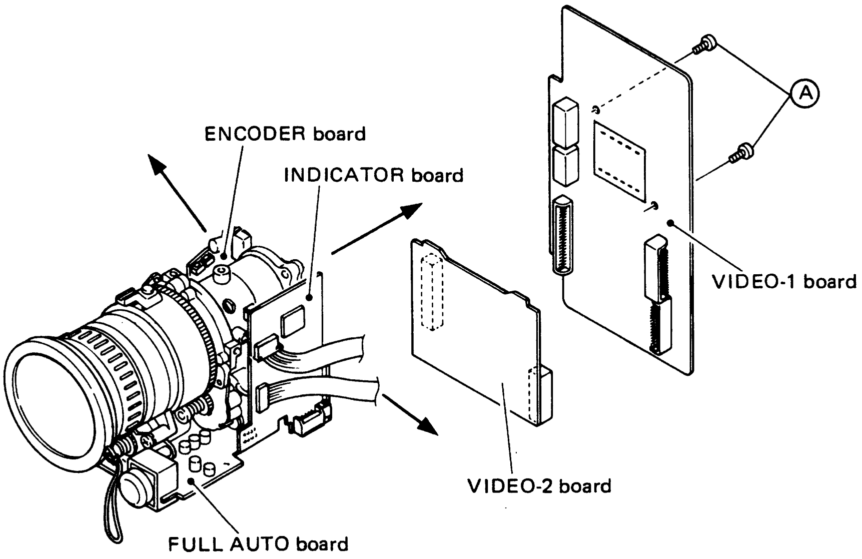

ENCODER board
INDICATOR board
Ⓐ
VIDEO-1 board
VIDEO-2 board
FULL AUTO board

Fig. 1-9-2

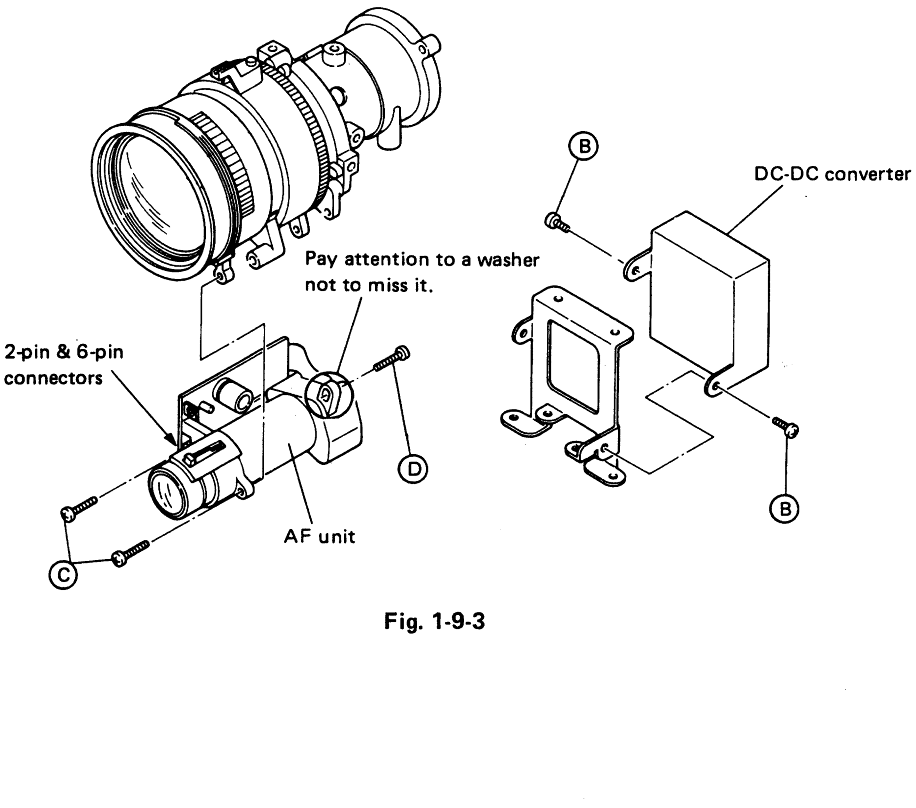

Ⓑ
DC-DC converter
Pay attention to a washer not to miss it.
2-pin & 6-pin connectors
Ⓓ
AF unit
Ⓑ
Ⓒ

Fig. 1-9-3

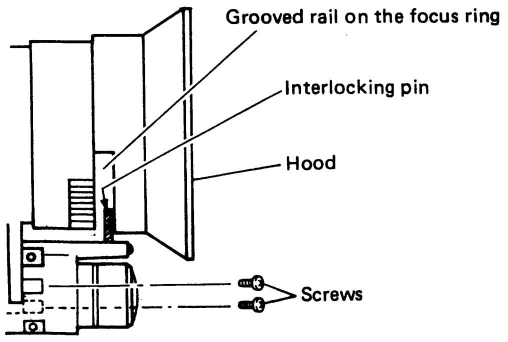

Grooved rail on the focus ring
Interlocking pin
Hood
Screws

Fig. 1-9-4

9. Secure the AF unit with a screw Ⓓ (Fig. 1-9-3) from the back. At this time, make sure to set a washer between the optical block and the AF unit, and Ⓓ , holding the AF unit in the direction of the arrow mark tighten the screw locating it around the center of the AF unit's slider plate.
10. After replacement, perform adjustments to be described below.

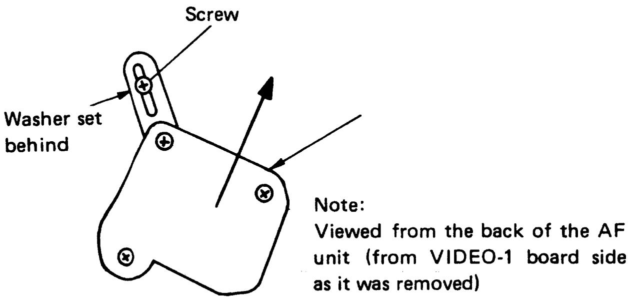

Screw
Washer set behind
Note:
Viewed from the back of the AF unit (from VIDEO-1 board side as it was removed)

Fig. 1-9-5

SECTION 2
DECK SECTION ADJUSTMENT

2.1 PREPARATONS

2.1.1 Precautions

Electrical adjustments are generally necessitated after replacing worn mechanical parts or video heads because of interrelationship between those parts and various electrical circuits.

In the event of malfunction with electrical circuits, troubleshooting with the aid of proper test instruments must be done first, and then, commence necessary repair, replacement, and adjustment, etc.

For adjustment of electrical circuits equipped with trimming resistors, replace those necessary for the adjustment with variable resistors only in the servicing period.

2.1.2 Hooking up

When adjusting the deck section, hook it up as shown in Fig. 2-1-1 by using the Y/C separator and patch cords.

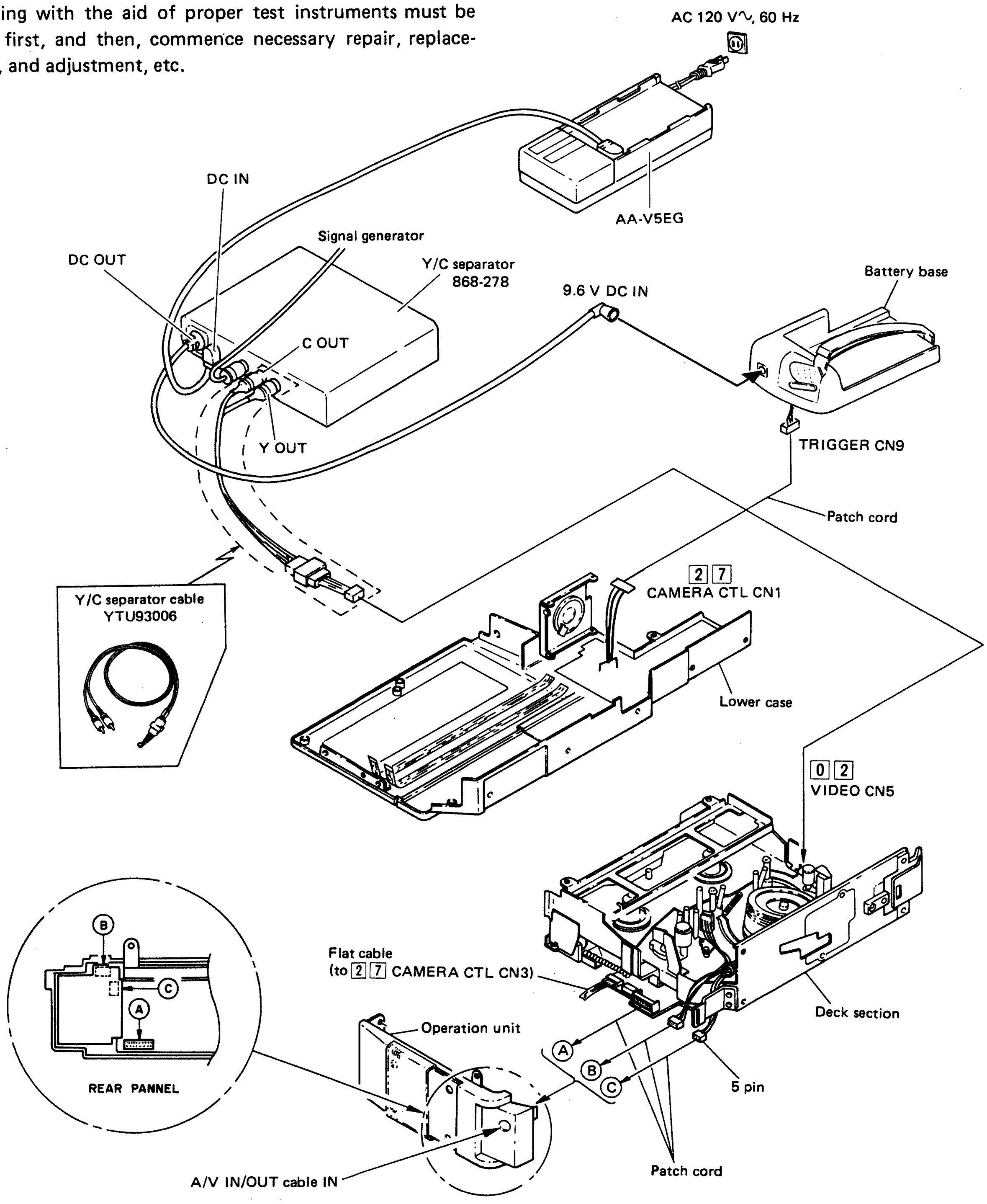

AC 120 V∿, 60 Hz
AA-V5EG
DC IN
Signal generator
DC OUT
Y/C separator
868-278
9.6 V DC IN
Battery base
C OUT
Y OUT
TRIGGER CN9
Patch cord
2 7 CAMERA CTL CN1
Y/C separator cable
YTU93006
Lower case
0 2 VIDEO CN5
B
C
A
REAR PANNEL
Flat cable
(to 2 7 CAMERA CTL CN3)
Operation unit
Deck section
A
B
C
5 pin
Patch cord
A/V IN/OUT cable IN

Fig. 2-1-1 Deck section adjustment

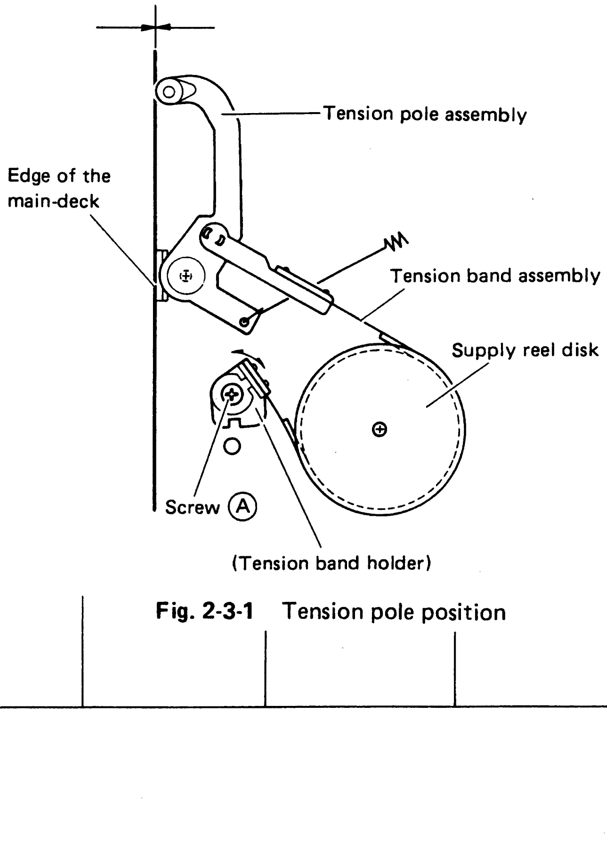
2.2 REGULATOR ($\boxed{0}\boxed{1}$ M/S/A board)

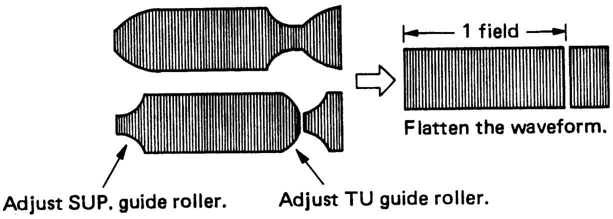
Note: Unless otherwise specified, all test points and adjustment parts are located on the M/S/A board.

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
1	8.0 V switching regulator	REC	TP203 (REG 8.0 V OUT)	R7 (REG 8.0 V)	1) Adjust R7 for 8.0 V ± 0.2 V DC at TP203.
2 (A)	Battery alarm	REC DC 9.05 V	IC301 pin 49 (B. ALARM CTL OUT)	R4 (BATTERY ALARM)	1) Supply 9.05 V DC to the unit by adjusting AA-V5EG output voltage. 2) Adjust R4 to the position that potential just changes from Low to High at IC301 pin 49. **Note:** Adjust VR2 of the MAIN board of AA-V5EG/EK to obtain 9.05 V DC.
2 (B)	Battery alarm	REC DC 9.05 V to BATT terminal	IC301 pin 49 (B. ALARM CTL OUT)	R4 (BATTERY ALARM)	1) In REC mode, supply 9.05 V DC to the BATT terminal. 2) Adjust R4 to the position that potential just changes from Low to High at IC301 pin 49.

2.3 SERVO & INTERCHANGEABILITY ($\boxed{0}\boxed{1}$ M/S/A board & Mechanism)

Note: After changing the whole drum ass'y or the upper drum, the following adjustments must be performed.

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
1	Back tension		 Tension pole assembly Edge of the main-deck Tension band assembly Supply reel disk Screw Ⓐ (Tension band holder) **Fig. 2-3-1** Tension pole position		1) Without a tape, set for PLAY mode. 2) Confirm that the tension pole is aligned to the edge of the main deck as shown in Fig. 2-3-1. 3) If necessary, loosen screw Ⓐ a little bit and adjust the tension band holder position. **Notes 1:** (1) For service procedures that call for operation of the set without a tape cassette, perform as below. (2) Disable the photo transistor sensors (END/START SENSOR) on the main-deck by covering with opaque covers. (3) The desired modes can be obtained by using the operation swithes. **Notes 2:** (1) If self-recording or playback picture is abnormal, check the back tension value. (2) Use the back tension cassette gauge and set for the REC mode. (3) Confirm the indication is within 40 ± 6 gf-cm. (4) If necessary, replace the tension band ass'y severe variation may necessitate replacing the supply reel disk.

<table>
<tr><th rowspan="2">No.</th><th rowspan="2">Item</th><th rowspan="2">Mode & Signal</th><th>Test Point</th><th>Adjustment Parts</th><th rowspan="2">Procedure</th></tr>
<tr><th colspan="2">Waveform & Adjustment</th></tr>
<tr><td>2</td><td>Tape pattern</td><td>MH-2 Stairstep</td><td>TP6 (PB FM OUT)
0 2 VIDEO
TP11 (D. FF)
0 2 VIDEO</td><td>Supply and Take-up guide rollers</td><td rowspan="2">1) Connect the oscilloscope to the TP6. Trigger the oscilloscope externally with TP11 and set the trigger slope to plus (+).
2) Play stairstep portion of the alignment tape MH-2.
3) Adjust the Tracking CTL for maximum FM output level. While observing the FM waveform, turn the supply or take-up guide rollers to get a flat waveform by a screwdriver.
4) While varying the Tracking CTL from maximum to minimum FM level, confirm FM waveform is always flat.
If there is falling or raising portions, stop turning the Tracking CTL and perform fine adjustment of supply or take-up quide rollers so that waveform is as flat as possible.
Repeat procedure 4) several times.
5) Set for Stop and then for Playback mode again.
Confirm, when varying the Tracking CTL, FM waveform variation is always flat.
6) Use a self-recording tape and perform recording and playback.
Confirm, when varying the Tracking CTL, FM waveform variation is always flat.
Note: When turning the guide rollers, slightly turn (less than 180° at a time).
7) During Play mode, observe tape at the input and output portions of the head drum lead. Confirm that the tape slips neither upward nor downward with respect to the lead.
Slips upward: Sound becomes produced by contact between tips of rotating heads and edge of tape.
Slips downward: Tape curls or wrinkles from contacting lead face (sound may also be produced).
8) During Playback and Search modes, confirm absence of tape slipping or curling at the imdance roller.
If necessary, use a metalic nutdriver to turn the impedance roller to align the lower flange of the impedance roller with the lower edge of the tape. (Do not turn more than 180° from the original position.)
Note: Concerning tape curling at the take-up guide poles, the A/C head slant must be adjusted.</td></tr>
<tr><td></td><td colspan="4">

1 field
Flatten the waveform.
Adjust SUP. guide roller.
Adjust TU guide roller.

Fig. 2-3-2 Tape pattern adjustment-1

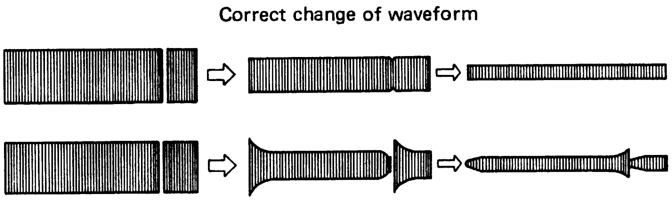
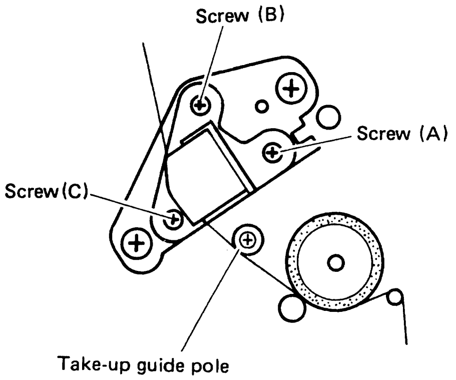
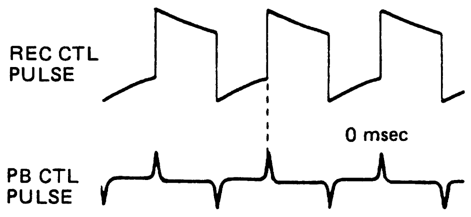
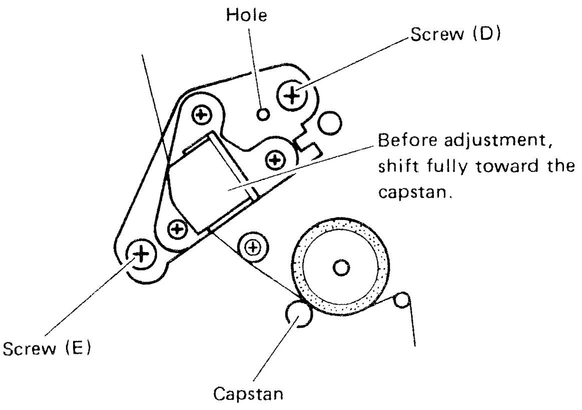
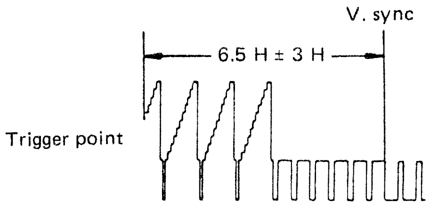



Fig. 2-3-3 Tape pattern adjustment-2</td></tr>
</table>

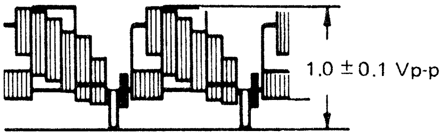
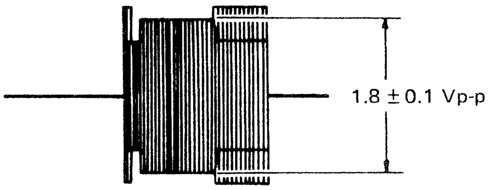
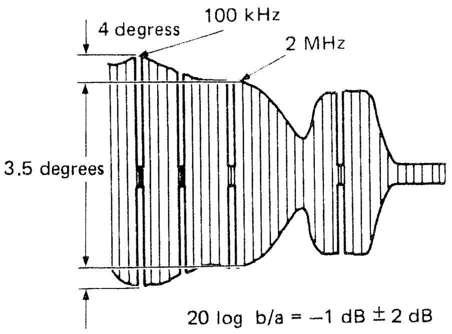
No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
3	A/CTL head height and azimuth	MH-2 7 kHz (Stairstep)	TP202 (AUDIO OUT) $\boxed{0}\boxed{1}$ M/S/A  **Fig. 2-3-4** A/C head inclination	A/CTL head	**Note:** Incorrect A/C head height can impair audio signal-to-noise ratio when playing back a pre-recorded tape. 1) For A/C head inclination, adjust screw (A) so that small tape wrinkles are not produced at the take-up guide pole. Turn screw (A) clockwise so that the tape wrinkles are apparent with the lower flange of the take-up guide pole, then turn screw (A) counterclockwise so that the wrinkles smooth out. 2) Adjust azimuth with screw (B). 3) For A/C head height, turn screws (A), (B) and (C) in succession by small and equal increments at a time and adjust for maximum audio output level.
4	Tracking preset	SP REC then PB Tracking CTL : Click position	TP101 (CTL OUT) $\boxed{0}\boxed{1}$ M/S/A TP11 (D. FF) $\boxed{0}\boxed{2}$ VIDEO for trigger  **Fig. 2-3-5** Tracking preset	R114 (TRACKING PRESET)	1) Connect the oscilloscope to TP101 and TP11 which is for external trigger. 2) Use the self-recording tape and perform recording. During recording, make a note of the phase of TP101 raising point. 3) Set the Tracking CTL to the click position and play the portion recorded in the step 2). Adjust R114 so that the raising pulse of PB control signal coincides with the phase of noted recording control signal.

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
5	Control head phase (X value)	MH-2 Stairstep Tracking CTL: Click position	TP6 (PB FM OUT) $\boxed{0}$ $\boxed{2}$ VIDEO TP11 (D. FF) $\boxed{0}$ $\boxed{2}$ VIDEO for trigger  Hole Screw (D) Before adjustment, shift fully toward the capstan. Screw (E) Capstan **Fig. 2-3-6** CTL head phase adjustment	CTL head phase	1) Connect the oscilloscope to TP6 and TP11 which is for external trigger. 2) Set the TRACKING knob to AUTO (center detent position). 3) Loosen screws (D) and (E) a little bit, then cover screw (D) with the A/CTL head positioning tool and set the pin of the tool into the hole next to screw (D). 4) Turn the tool counterclockwise to shift the A/C head fully in the direction of the capstan, and then gradually turn the tool clockwise and observe the FM envelope output. 5) Set the A/C head at the point of the first output peak.
6	PB switching point	MH-2 Stairstep Tracking CTL: Click position	TP10 (VIDEO OUT) $\boxed{0}$ $\boxed{2}$ VIDEO TP11 (D. FF) $\boxed{0}$ $\boxed{2}$ VIDEO for trigger  **Fig. 2-3-7** PB switching point	R124 (PB SWITCHING POINT) $\boxed{0}$ $\boxed{2}$ VIDEO	1) Connect the oscilloscope to TP10 on the VIDEO board and TP11 which is for external trigger, and play stairstep portion of MH-2. 2) When the Tracking CTL is at center position, adjust R124 so that the trigger point becomes 6.5H ± 3H before V. sync.

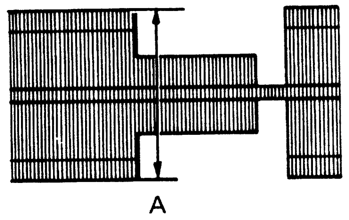
2.4 VIDEO (02 Video board)

Note: Unless otherwise specified, all test points and adjustment parts are located on the VIDEO board.

2.4.1 Y (luminance) circuit

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
1	Camera E-E Y level	E-E Camera input (from Y/C separator) Color bars (100 IRE)	TP10 (VIDEO OUT)  **Fig. 2-4-1** C E-E Y level	R40 (C E-E Y LEVEL)	1) Supply the color bar signal and set for the REC (monitor) mode. **Note:** Connect the A/V cable between the A/V output terminal and a video monitor to terminate the VIDEO OUT with a 75-ohm terminator. 2) Adjust R40 for 1.0 ± 0.1 Vp-p at TP10. **Note:** Without termination, the output level at TP10 should be approx. 2.0 ± 0.1 Vp-p.
2	REC FM level	SP REC Color bars	TP4 (REC FM OUT)  **Fig. 2-4-2** REC FM level	R32 (REC FM LEVEL)	1) Record the color bars signal. 2) Adjust R32 so that the pedestal portion becomes 1.8 ± 0.1 Vp-p.
3	PB RF equalizer	SP REC then PB Video sweep	TP10 (VIDEO OUT) TP11 (D. FF) for external trigger — Video sweep —  **Fig. 2-4-3** PB RF equalizer	R10 (PB RF EQ)	1) Supply the video sweep signal to the Y/C separator. Disconnect the color output connector from the Y/C separator in order to supply only Y signal. 2) Record this signal and play the same portion. 3) Connect the oscilloscope to TP10 and TP11 which is for external trigger. 4) Set 100 kHz level for 4 graduations on the oscilloscope screen. 5) Adjust R10 so that the 2 MHz level becomes for 3.5 graduations on the oscilloscope. **Note:** If this adjustment is not correct, B/W image reversal (tearing) may occur during REC/PB of scenes with strong light/dark contrast.

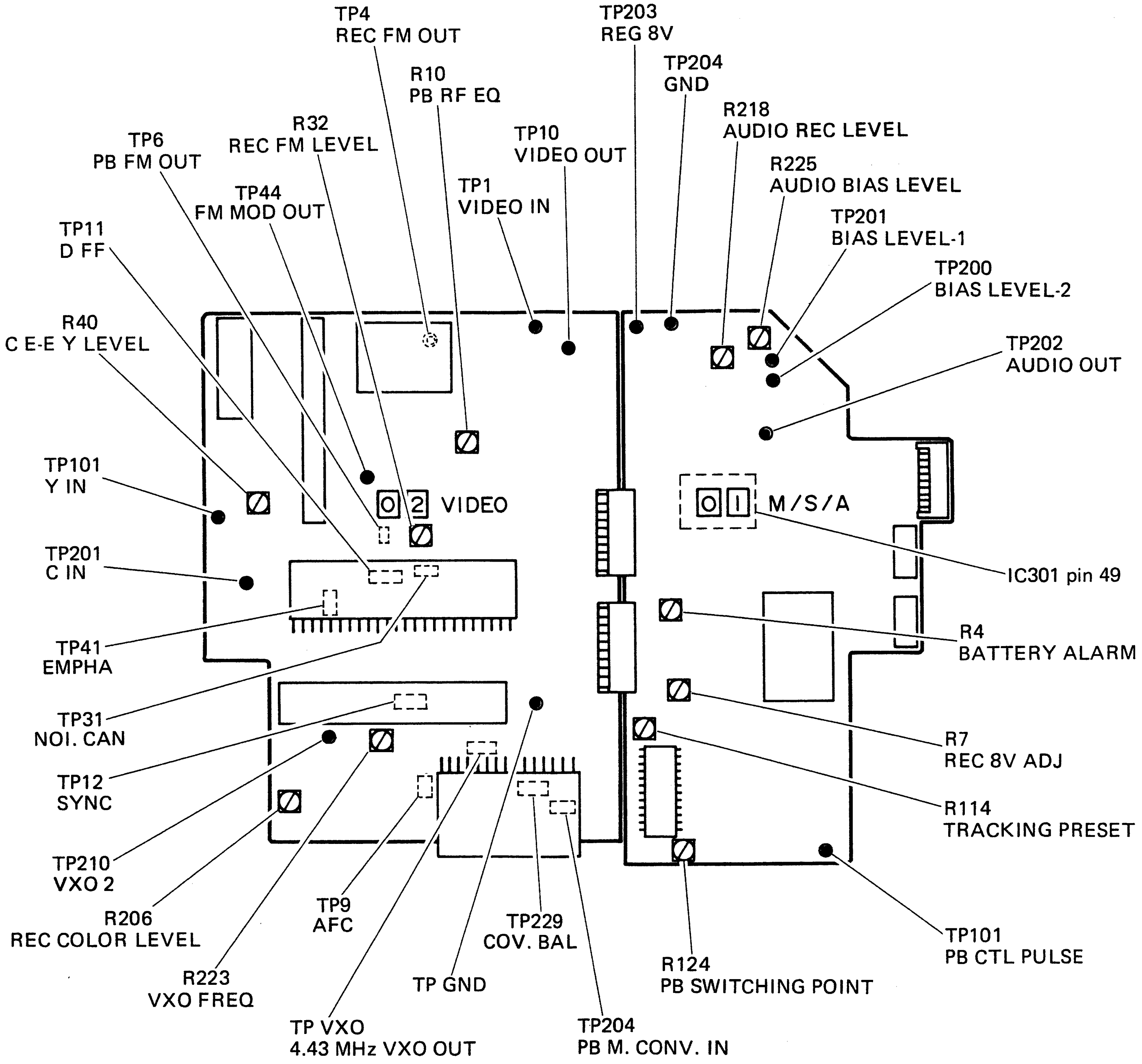
2.4.2 Color circuit

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
1	4.43 MHz VXO	MH-2 Color bars	TP VXO (4.43 MHz VXO OUT)	R223 (VXO FREQ)	1) Play back the color bar portion of MH-2 and connect the frequency counter to TP VXO. 2) Adjust R223 for 4.433619 ± 80 Hz.
2	REC color level	MH-2 Color bars SP Color bars REC then PB	TP204 (PB M. CONV. IN) TP11 (D. FF) for external trigger  Fig. 2-4-4 REC color level	R206 (REC COLOR LEVEL)	1) Play the color bar portion of MH-2. Connect the oscilloscope to TP204 and TP11 which is for external trigger for V-rate. 2) Turn the Tracking CTL for maximum color level. 3) Note of the higher channel level for A. 4) Record the color bar signal and then play the same portion. 5) Confirm that the higher channel level is 0.9 x A ± 10%. 6) If it is out of the above specification, adjust R206 in recording and repeat steps 4) and 5).

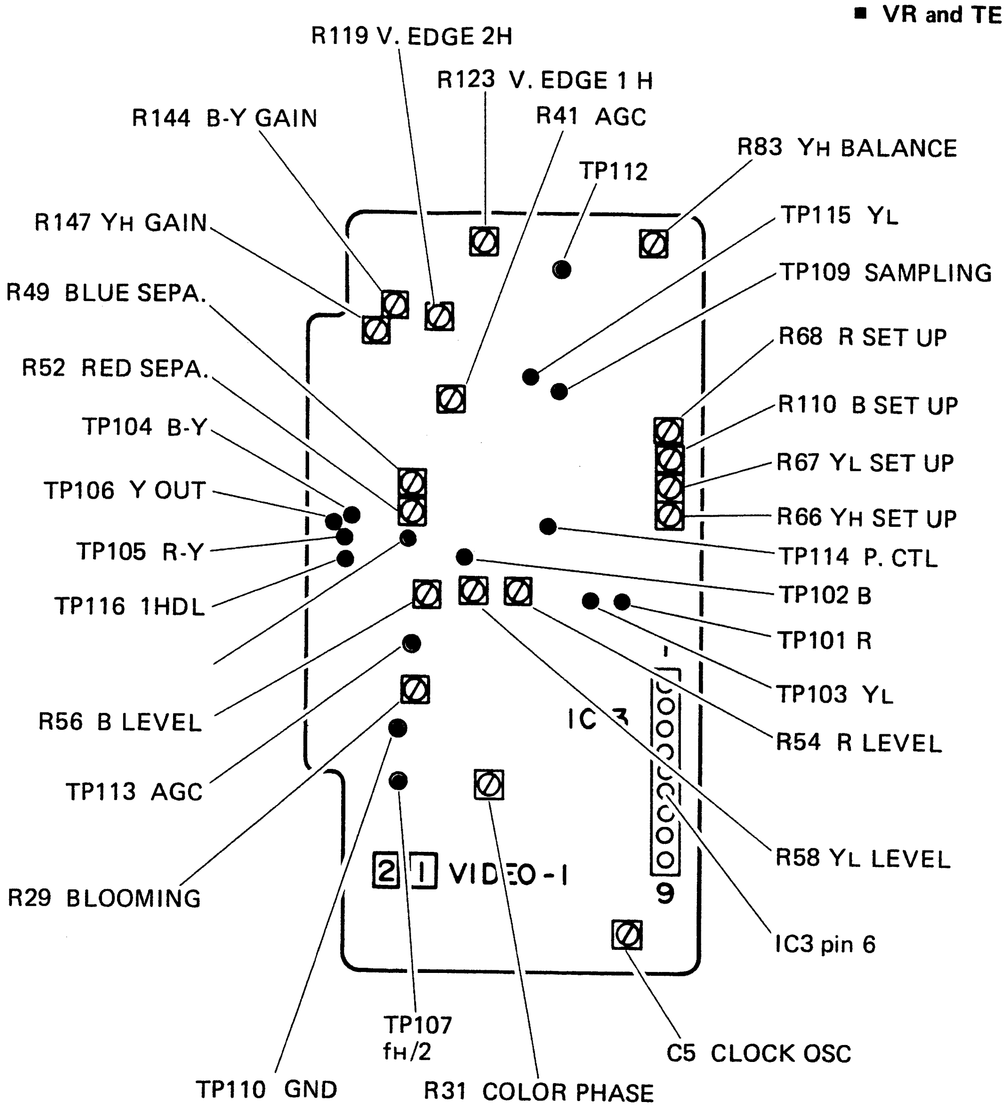
2.5 AUDIO CIRCUIT ($\boxed{0}\boxed{1}$ M/S/A board)

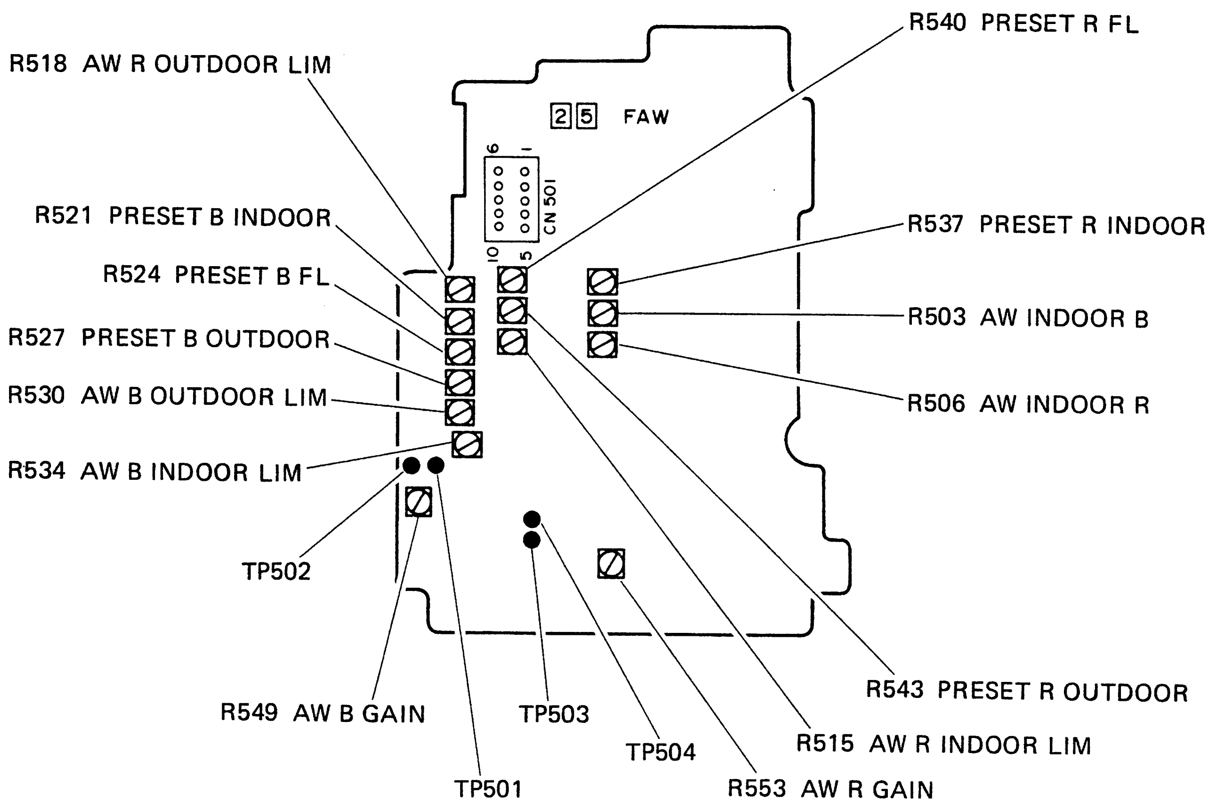
No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
1	REC level	1 kHz, –8 dBs input REC then PB	LINE OUT	R218 (AUDIO REC LEVEL)	1) During Recording, adjust R218 so that the LINE OUT value is –6 dBs during Playback.
2	Audio bias level	REC No audio signal input	TP200 (BIAS LEVEL - 2) TP201 (BIAS LEVEL - 1)	R225 (AUDIO BIAS LEVEL)	1) Connect an audio tester's HOT side to TP201 and GND to TP200, respectively. 2) Adjust R225 so that bias level between TP201 and TP200 becomes 2.6 mVrms.

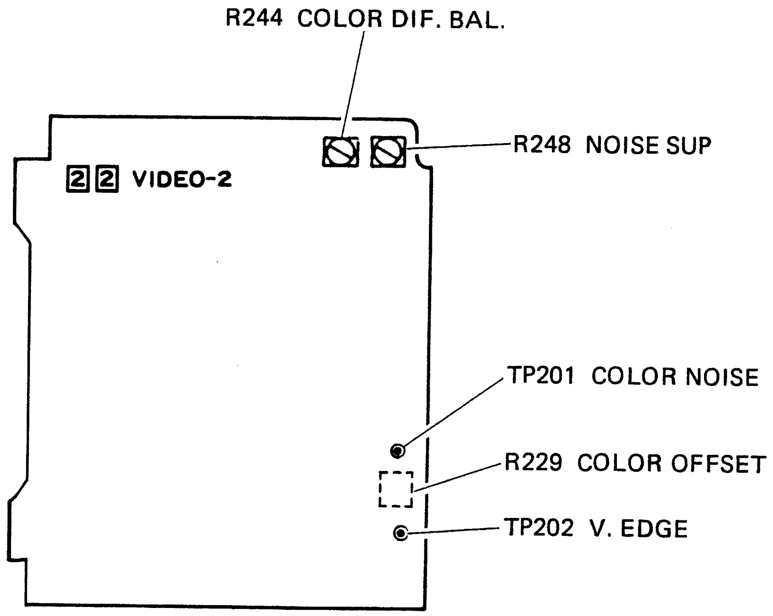
■ VR and TESTPOINT LOCATION (DECK SECTION)

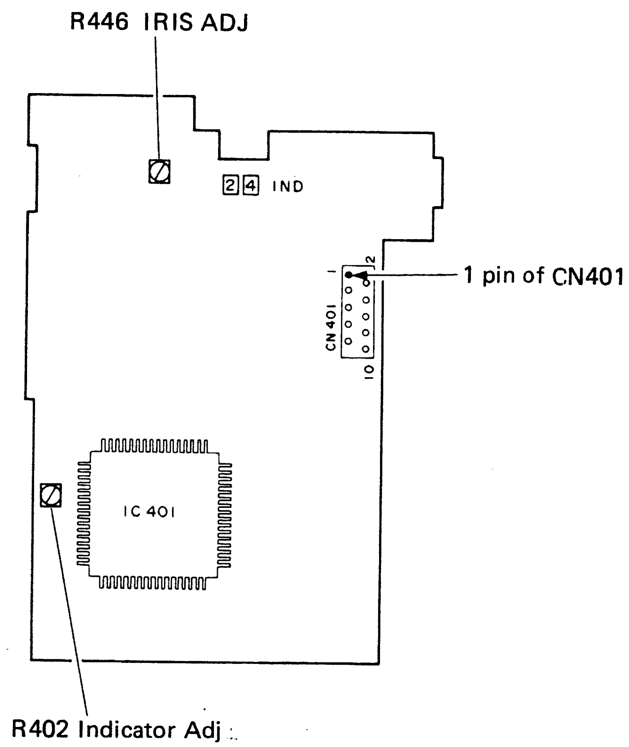

TP4
REC FM OUT
TP203
REG 8V
TP204
GND
R10
PB RF EQ
R218
AUDIO REC LEVEL
R32
REC FM LEVEL
TP6
PB FM OUT
TP10
VIDEO OUT
R225
AUDIO BIAS LEVEL
TP44
FM MOD OUT
TP1
VIDEO IN
TP201
BIAS LEVEL-1
TP11
D FF
TP200
BIAS LEVEL-2
R40
C E-E Y LEVEL
TP202
AUDIO OUT
TP101
Y IN
02 VIDEO
01 M/S/A
TP201
C IN
IC301 pin 49
TP41
EMPHA
R4
BATTERY ALARM
TP31
NOI. CAN
R7
REC 8V ADJ
TP12
SYNC
R114
TRACKING PRESET
TP210
VXO 2
R206
REC COLOR LEVEL
TP9
AFC
TP229
COV. BAL
TP101
PB CTL PULSE
R223
VXO FREQ
TP GND
R124
PB SWITCHING POINT
TP VXO
4.43 MHz VXO OUT
TP204
PB M. CONV. IN

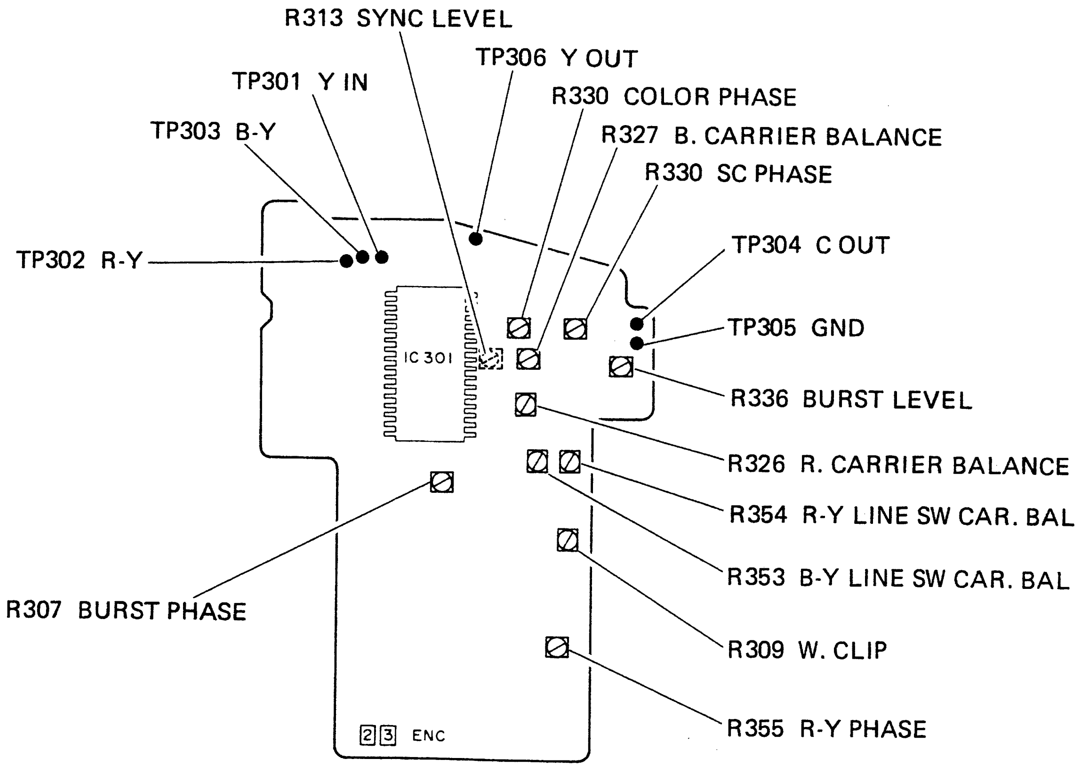
■ VR and TESTPOINT LOCATION (CAMERA SECTION)


R119 V. EDGE 2H
R123 V. EDGE 1 H
R144 B-Y GAIN
R41 AGC
TP112
R83 Y_H BALANCE
R147 Y_H GAIN
TP115 Y_L
TP109 SAMPLING
R49 BLUE SEPA.
R68 R SET UP
R52 RED SEPA.
R110 B SET UP
TP104 B-Y
R67 Y_L SET UP
TP106 Y OUT
R66 Y_H SET UP
TP105 R-Y
TP114 P. CTL
TP116 1HDL
TP102 B
TP101 R
TP103 Y_L
R56 B LEVEL
R54 R LEVEL
TP113 AGC
IC 3
R58 Y_L LEVEL
R29 BLOOMING
21 VIDEO-1
9
IC3 pin 6
TP107 $f_H/2$
C5 CLOCK OSC
TP110 GND
R31 COLOR PHASE


R540 PRESET R FL
R518 AW R OUTDOOR LIM
25 FAW
6
1
CN501
10
5
R521 PRESET B INDOOR
R537 PRESET R INDOOR
R524 PRESET B FL
R503 AW INDOOR B
R527 PRESET B OUTDOOR
R530 AW B OUTDOOR LIM
R506 AW INDOOR R
R534 AW B INDOOR LIM
TP502
R543 PRESET R OUTDOOR
R549 AW B GAIN
TP503
TP504
R515 AW R INDOOR LIM
TP501
R553 AW R GAIN


R244 COLOR DIF. BAL.
22 VIDEO-2
R248 NOISE SUP
TP201 COLOR NOISE
R229 COLOR OFFSET
TP202 V. EDGE


R446 IRIS ADJ
24 IND
1
2
CN401
10
1 pin of CN401
IC 401
R402 Indicator Adj


R313 SYNC LEVEL
TP306 Y OUT
TP301 Y IN
R330 COLOR PHASE
TP303 B-Y
R327 B. CARRIER BALANCE
R330 SC PHASE
TP302 R-Y
TP304 C OUT
IC 301
TP305 GND
R336 BURST LEVEL
R326 R. CARRIER BALANCE
R354 R-Y LINE SW CAR. BAL
R307 BURST PHASE
R353 B-Y LINE SW CAR. BAL
R309 W. CLIP
R355 R-Y PHASE
23 ENC

SECTION 3
CAMERA SECTION ADJUSTMENT

3.1 PRECAUTIONS

3.1.1 Precautions

1. In the event of malfunction with electrical circuir, trouble shooting with the aid of proper test instruments must be done first, and then, commerce necessary repair, replacement, and adjustment.
2. Test pattern illumination:
   Use halogen lamps of "3,200°K" and set them to illuminate the test pattern evently at approximately 4,000 lux with the aid of a lux meter.
3. Test patterns:
   Use clean "Grayscale" and "Color bar" pattern charts.
4. Test points and potentiometer:
   They are very small and easy to be destroved. Therefore, pav enough attention to them not to be shorted and destroyed.
   Use the adjustment tools for adjustment.

3.1.2 Hooking up

When adjusting the camera section, hook it as shown in Fig. 3-1-1 by using the patch cord and the camera stand.

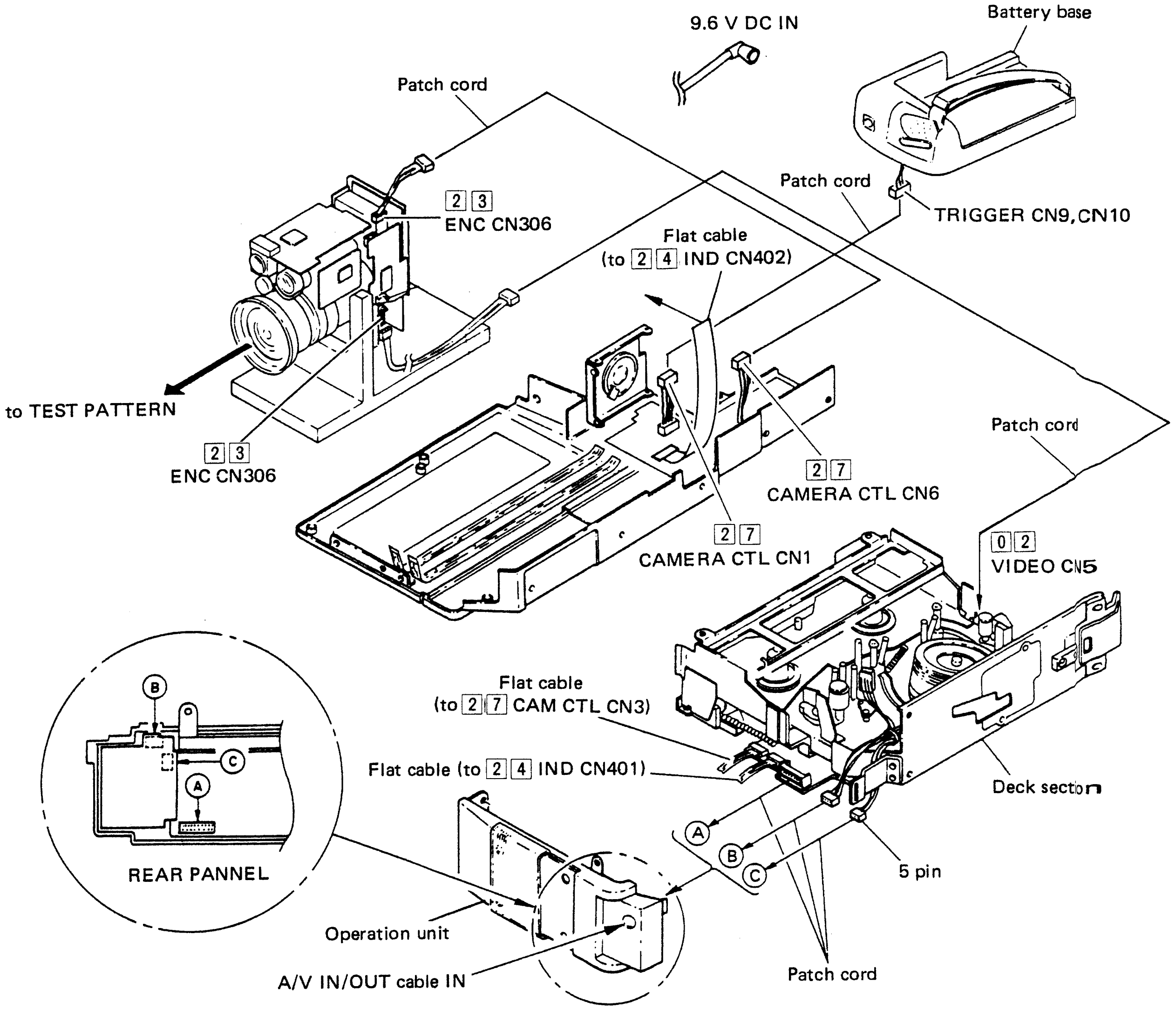
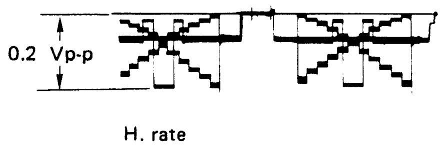
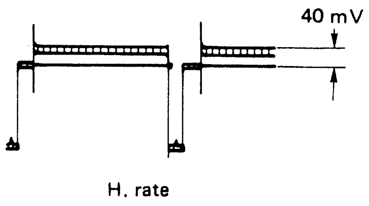
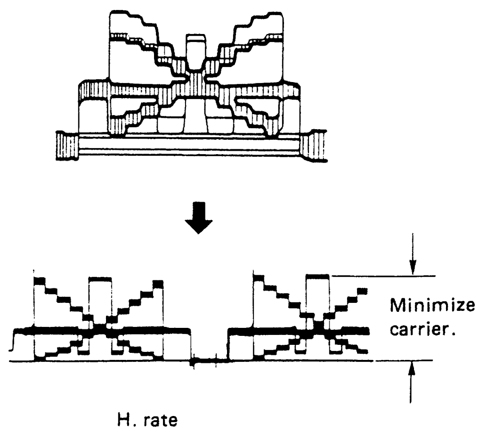

9.6 V DC IN
Battery base
Patch cord
2 3 ENC CN306
Patch cord
TRIGGER CN9,CN10
Flat cable (to 2 4 IND CN402)
to TEST PATTERN
Patch cord
2 3 ENC CN306
2 7 CAMERA CTL CN6
2 7 CAMERA CTL CN1
0 2 VIDEO CN5
B
C
A
REAR PANNEL
Flat cable (to 2 7 CAM CTL CN3)
Flat cable (to 2 4 IND CN401)
Deck section
A
B
C
5 pin
Operation unit
A/V IN/OUT cable IN
Patch cord

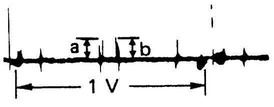
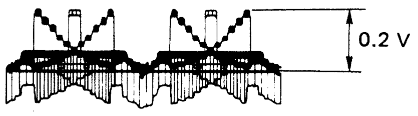
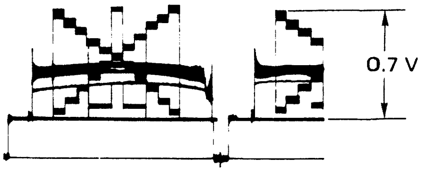
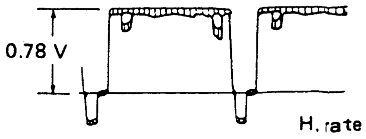
Fig. 3-1-1

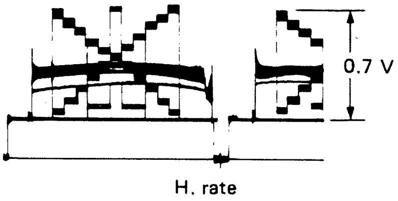
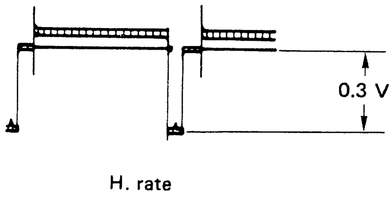
3.2 Y (Luminance) CIRCUIT

Note: For adjustment, set the controls to the following position unless otherwise specified.

	Control		Setting position
Monitor mode:	White balance	–	PRESET INDOOR
	Focus	–	MANUAL
	Shutter speed	–	STD

No.	Item	Mode & Signal	Check Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
1	Clock osc.	–	IC3 pin 6 $\boxed{2}\boxed{1}$ VIDEO-1	C5 (CLOCK OSC) $\boxed{2}\boxed{1}$ VIDEO-1	1) Connect a frequency counter to IC3 pin 6, and adjust C5 to obtain 9.534964 MHz ± 30 Hz.
2	Blooming	–	TV monitor	R29 (BLOOMING) $\boxed{2}\boxed{1}$ VIDEO-1	1) Pick up a fluorescent light and observe the image on a TV-monitor. 2) Turn R29 fully in both directions and notice the range in which blooming occurs. 3) Then adjust R29 to where blooming is absent.
3	CDS output	Grey scale	TP109 $\boxed{2}\boxed{1}$ VIDEO-1	R446 (CDS ADJ) $\boxed{2}\boxed{4}$ INDICATOR	1) Pick up the grey scale pattern and observe waveform at TP109. 2) Adjust R446 to obtain 0.2 V. 
4	Y_H setup	Lens: Closed	TP306 (Y OUT) $\boxed{2}\boxed{3}$ ENCODER	R66 (Y_H SETUP) $\boxed{2}\boxed{1}$ VIDEO-1	1) Cap the lens. 2) Adjust R66 so that the setup level at TP306 becomes 40 mV. 
5	Y_H balance	Grey scale	TP116 (1H DL) $\boxed{2}\boxed{1}$ VIDEO-1	R83 (Y_H BALANCE) $\boxed{2}\boxed{1}$ VIDEO-1	1) Pick up the grey scale pattern and observe waveform at TP116. 2) Adjust R83 to minimize carrier waveform on the whole. 

No.	Item	Mode & Signal	Check Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
6	V. edge (2H/1H) balance	Grey scale	TP202 (V. EDGE) [2][2] VIDEO-2	R119 (V. EDGE 2H) R123 (V. EDGE 1H) [2][1] VIDEO-1	1) Pick up the grey scale pattern and observe waveform at TP202. 2) Adjust R123 so that average level of the waveform becomes minimum. 3) Next adjust R119 so that levels of [a] and [b] of the waveform (see figure) becomes equal. 
7	Y_H gain	Grey scale	TP109 (SAMPLING) [2][1] VIDEO-1 TP306 (Y OUT) [2][3] ENCODER	R446 (IRIS ADJ) [2][4] INDICATOR R147 (Y_H GAIN) [2][1] VIDEO-1	1) Connect the oscilloscope to TP109 with a resistor of approx. 10 kΩ, and pick up the grey scale pattern. 2) Adjust R446 so that level becomes 0.2 V.  3) Connect the oscilloscope to TP306 and adjust R147 to obtain 0.7 V of signal level. 
8	White clip	Grey scale	TP306 (Y OUT) [2][3] ENCODER	R446 (IRIS ADJ) [2][4] INDICATOR R309 (W. CLIP) [2][3] ENCODER	1) Connect the oscilloscope to TP306 and pick up the grey scale pattern. 2) Adjust R446 so that signal waveform becomes broken on the oscilloscope screen (Iris: open). 3) Adjust R309 to obtain 0.78 V of clipping level. 

No.	Item	Mode & Signal	Check Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
9	Iris adj.	Grey scale	TP306 (Y OUT) [2] [3] ENCODER	R446 (IRIS ADJ) [2] [4] INDICATOR	1) Connect the oscilloscope to TP306. 2) With the iris set to AUTO, adjust R446 so that IRIS level becomes 0.7 V. 
10	Sync level	Lens: Closed	TP306 (Y OUT) [2] [3] ENCODER	R313 (SYNC LEVEL) [2] [3] ENCODER	1) Cap the lens. 2) Adjust R313 so that signal level at TP306 becomes 0.3 V. 
11	AGC	Lens: Closed	TP113 (AGC) [2] [1] VIDEO-1	R41 (AGC) [2] [1] VIDEO-1	1) Cap the lens. 2) With the oscilloscope connected to TP113, adjust R41 to obtain 1.1 V of the DC voltage.

3.3 COLOR CIRCUIT

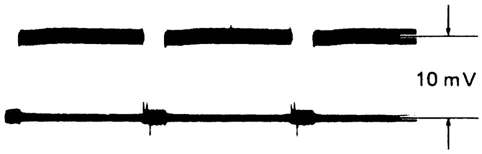
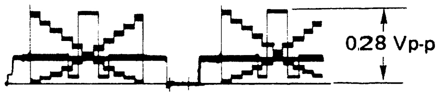
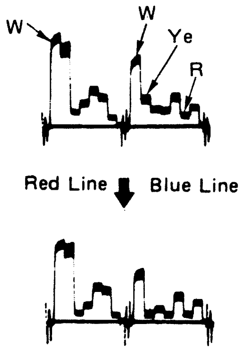
Note: For adjustment, set the controls to the following positions unless otherwise specified.

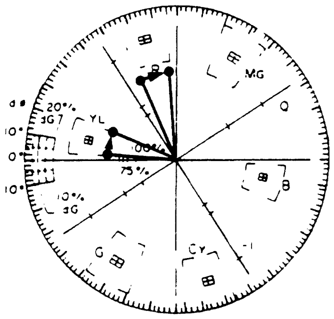
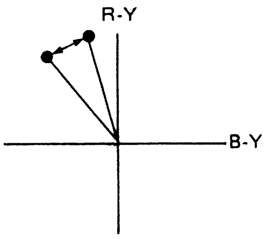
	Control	Setting position
Monitor mode:	White balance	– PRESET INDOOR
	Focus	– MANUAL
	Shutter speed	– STD

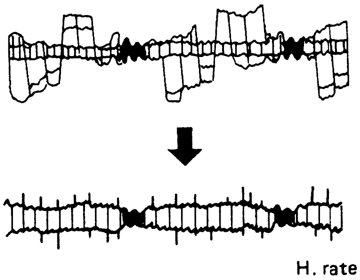
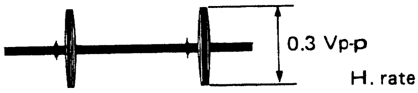
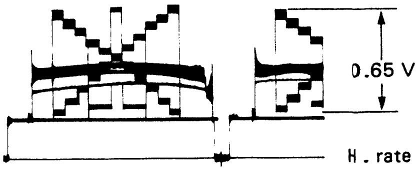
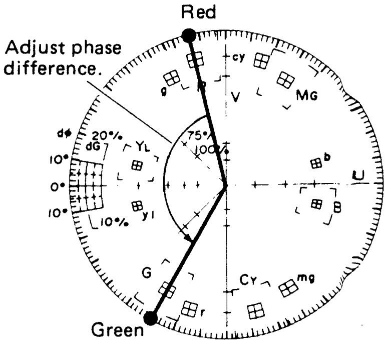
3.3.1 Basic INDOOR mode

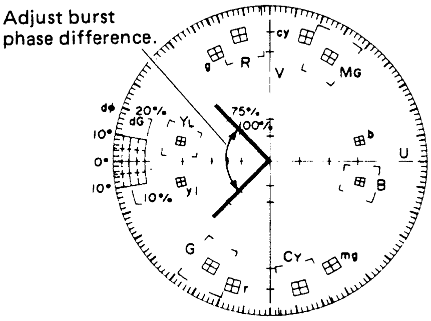
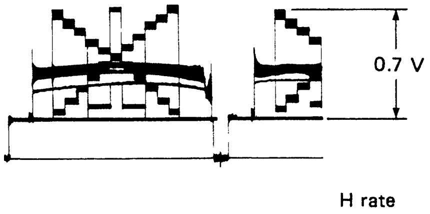
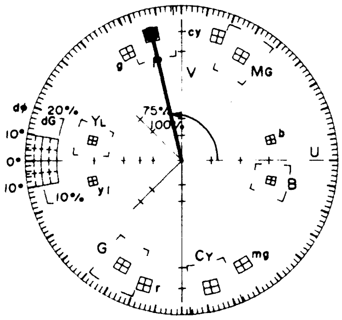
Note: 1) Test pattern illumination: Halogen lamps of 3200 K, more than 4000 lux

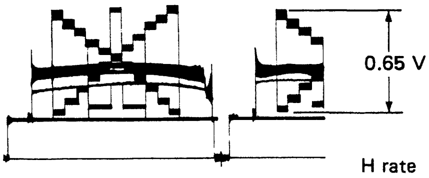
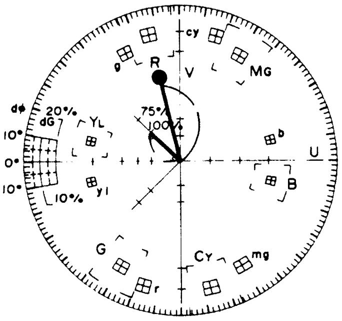
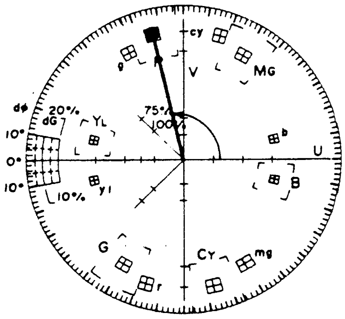
2) Pay careful attention that other light does not apply to the color sensor.

No.	Item	Mode & Signal	Check Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
1	YL setup	Lens: Closed	TP115 (YL) [2][1] VIDEO-1	R67 (YL SETUP) [2][1] VIDEO-1	1) Cap the lens. 2) Connect the oscilloscope to TP115. 3) Adjust R67 so that the setup level becomes 10 mV. 
2	YL process input level	Grey scale	TP306 (Y OUT) [2][3] ENCODER TP103 (YL) [2][1] VIDEO-1	R58 (YL LEVEL) [2][1] VIDEO-1	1) Observing the oscilloscope, confirm that signal level at TP306 is 0.7 V. (Refer to the step 7 "E-E Level".) 2) Connect the oscilloscope to TP103 and adjust R58 so that signal level at TP103 becomes 0.28 Vp-p. 
3	R/B separation	Color bar chart	TP101 (R) TP102 (B) [2][1] VIDEO-1 	R52 (RED SEPA.) R49 (BLUE SEPA.) [2][1] VIDEO-1	1) Pick up the color bar chart. 2) Observe waveform at TP101 with the oscilloscope and adjust the oscilloscope's time axis to check signals of red and blue lines respectively. 3) Noting the blue line, adjust R52 to equalize signals levels of the color pattern's yellow and red sections. 4) In the same manner as in 2) above, observe waveform at TP102 and adjust its time axis. 5) Noting the blue line, adjust R49 to equalize signal levels of the color pattern yellow and red sections. **Note:** The blue line means the scanning line that is the smaller in signal level of the color bar pattern's white section.

No.	Item	Mode & Signal	Check Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
4	R/B process input level	Grey scale	CN501 pin 9 CN501 pin 10 [2][5] FAW	R537 (PRESET R INDOOR) R521 (PRESET B INDOOR) [2][5] FAW	1) With the oscilloscope connected to pin 9 of CN501, and pick up the grey scale. Adjust R537 to obtain 2.68 V of DC voltage. 2) Change the oscilloscope connection to pin 10 of CN501, and adjust R521 to obtain 2.74 V of the DC voltage.
5	Carrier balance	–	Vectorscope TP114 (P. CTL) [2][1] VIDEO-1	R326 (R. CARRIER BALANCE) R327 (B. CARRIER BALANCE) [2][3] ENCONER	1) Shortcircuit between pin 1 of CN401 of [2][4] IND board and GND with a wire. 2) Connect the oscilloscope to TP114. 3) Adjust R326, R327 so that dots are positioned at the center of the vectorscope.
6	Color offset	–	TP105 (R-Y) [2][1] VIDEO-1	R229 (COLOR OFFSET) [2][2] VIDEO-2	1) Shortcircuit between CN401 pin 1 of [2][4] IND board and GND with a wire. 2) Connect the oscilloscope to TP105 and adjust R229 to minimize difference between line levels.
7 (A)	Color difference balance	Color bar chart	Vectorscope	R244 (COLOR DIF. BAL.) [2][2] VIDEO-2	1) Pick up the color bar chart. 2) By use of a vectorscope, adjust R244 so that dots are positioned at the same point being into one (in other words, to minimize movement of red signal).  MG Q YL 20% 10% 75% 100% B G CY R
7 (B)	Color difference balance	Color bar chart	TP104 (B-Y) TP105 (R-Y) [2][1] VIDEO-1	R244 (COLOR DIF. BAL.) [2][2] VIDEO-2	1) Pick up the color bar chart. 2) Set the oscilloscope to observe signal from TP104 on the X-axis while TP105's signal on the Y-axis (X-Y mode). 3) Adjust R244 to overlap dots at the same point (to minimize the red signal's movement). 

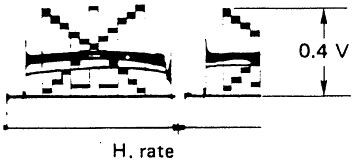
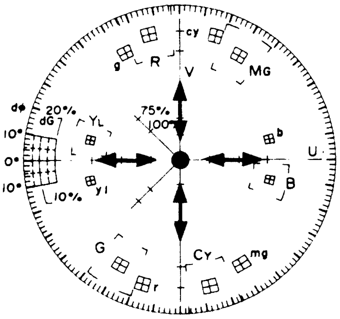
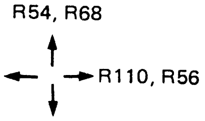
No.	Item	Mode & Signal	Check Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
8	Noise suppressor balance	Color bar chart	TP201 (COLOR NOISE) [2] [2] VIDEO-2	R248 (NOISE SUP) [2] [2] VIDEO-2	1) With the oscilloscope connected to TP201 pick up the color bar chart. 2) Adjust R248 to uniform waveform level at TP201 to the limit. 
9	Color phase	Grey scale	Monitor TV	R31 (COLOR PHASE) [2] [1] VIDEO-1	1) Pick up the grey scale. 2) Observing the video monitor's screen, adjust R31 to minize width of green or red zone appearing on the side edges of the white section to the utmost extent.
10	Burst level	Lens: Closed	TP305 (C. OUT) [2] [3] ENCODER	R336 (BURST LEVEL) [2] [3] ENCODER	1) Cap the lens. 2) Adjust R336 so that color burst signal level at TP305 becomes 0.3 Vp-p. 
11	B-Y gain	Color bar chart	Vectorscope TP306 (Y OUT) [2] [3] ENCODER	R446 (IRIS ADJ) [2] [4] INDICATOR R114 (B-Y GAIN) [2] [1] VIDEO-1	1) Connect the oscilloscope to TP306. 2) Adjust R446 so that IRIS level becomes 0.65 V.  3) Adjust R144 so that phase difference between red and green sections of the color bar chart becomes 137°.  **Note:** In the case the "Burst Phase" adjustment of the following won't be performed, perform the adjustment of "IRIS Level" and proceed to the next adjustment.

No.	Item	Mode & Signal	Check Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
12	Burst phase	Color bar chart	Vectorscope TP306 (Y OUT) [2][3] ENCODER	R307 (BURST PHASE) [2][3] ENCODER	**Note:** If this adjustment does not performed in succession to the previous step 11 "B-Y Gain", proceed to do this step after IRIS level is adjusted to 0.65 V. 1) Adjust R307 so that burst phase difference becomes 90°.  2) After this adjustment, make sure to confirm the burst level again.
13	Red phase	Color bar chart	Vectorscope TP306 (Y OUT) [2][3] ENCODER	R446 (IRIS ADJ) [2][4] INDICATOR R355 (R-Y PHASE) [2][3] ENCODER	1) Connect the oscilloscope to TP306. 2) Adjust R446 so that IRIS level becomes 0.7 V.  3) Adjust R355 so that phase of the red section of the color bar chart becomes 104°. 

No.	Item	Mode & Signal	Check Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
14	Color gain	Color bar chart	Vectorscope TP306 (Y OUT) [2] [3] ENCODER	R446 (IRIS ADJ) [2] [4] INDICATOR R333 (COLOR GAIN) [2] [3] ENCODER	1) Connect the oscilloscope to TP306. 2) Adjust R446 so that IRIS level becomes 0.65 V.  3) Adjust R333 so that COLOR level of the red section of the color bar chart becomes 1.1 times larger than the burst level of 0.3 Vp-p.  cy R V MG dφ 20% dG YL 75% 100% 10° 0° 10° b U B yl 10% G CY mg r
15	SC phase	Color bar chart	Vectorscope TP306 (Y OUT) [2] [3] ENCODER	R330 (SC PHASE) [2] [3] ENCODER	1) Connect the oscilloscope to TP306. 2) Adjust R330 so theat phase of the red section of the color bar chart becomes 104°.  cy V MG dφ 20% dG YL 75% 100% 10° 0° 10° b U B yl 10% G CY mg r

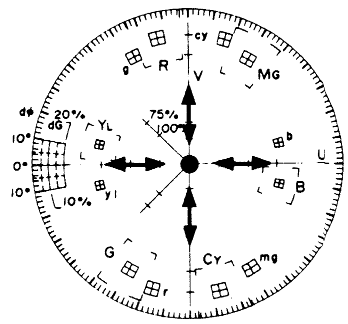
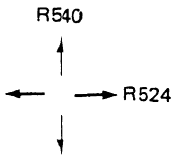
3.3.2 Preset IN-DOOR white balance

Notes: 1) Test pattern ilumination : Halogen lamps of 3,200°K
: More then 4,000 Lux
2) Pay careful attention that other light does not apply to the color sensor.

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
1	Preset IN-DOOR	Grey scale	Vectorscope TP306 (Y OUT) [2][3] ENCODER	R446 (IRIS ADJ) [2][4] INDICATOR R68 (R SETUP) R110 (B SETUP) R54 (R LEVEL) R56 (B LEVEL) [2][1] VIDEO-1	1) Connect the oscilloscope to TP306. 2) Adjust R446 so that iris level becomes 0.4 V.  3) Adjust R68 and R110 so that R and B setup levels center on the vectorscope respectively. 4) Adjust R54 and R56 to center R and B signal levels on the vectorscope. 5) Repeat the above steps 3) through 6) to gain satisfactory results for each item.  cy R V MG 75% 100 dφ 20% dG YL 10° 0° 10° 10% yl b U B G CY mg r  6) After complete adjustments, adjust R446 so that iris level becomes 0.7 V.

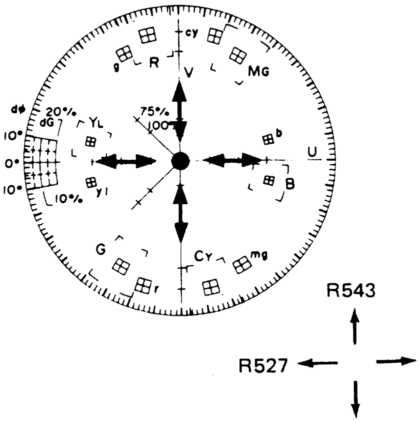
3.3.3 Preset FL (Fluorescent) white balance

Notes: 1) Test pattern ilumination : Halogen lamps of 3,200°K
: More then 4,000 Lux
2) Pay careful attention that other light does not apply to the color sensor.

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
1	Preset FL	Grey scale W. BAL. SW: FL (Fluorescent light) mode Color temperature conversion filters (C8 + CC10Y) → Lens	Vectorscope	R540 (PRESET R FL) R524 (PRESET B FL) $\boxed{2}\boxed{5}$FAW	1) With C8 + CC10Y filters attached to the lens pick up the grey scale. 2) Press the WHITE BALANCE switch to set the mode for FL (fluorescent light) mode. 3) Adjust R540 and R524 alternately to position dots on the vectorscope in the center of the screen.  R MG YL B G CY 20% 75% 100 10% dG dφ 10° 0° 10° U V 

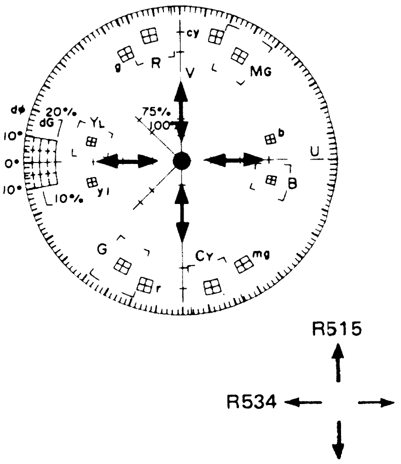
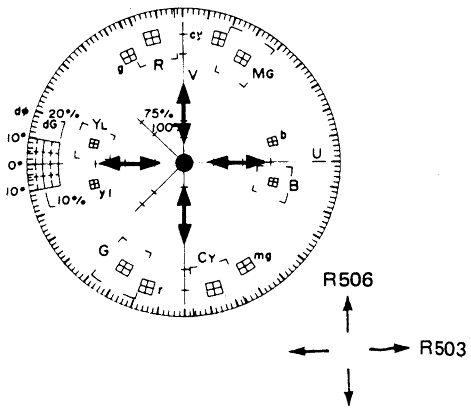
3.3.4 Preset outdoor

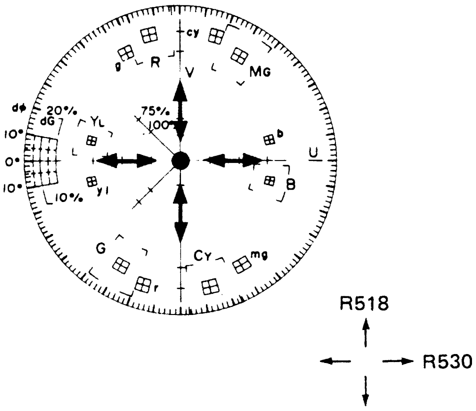
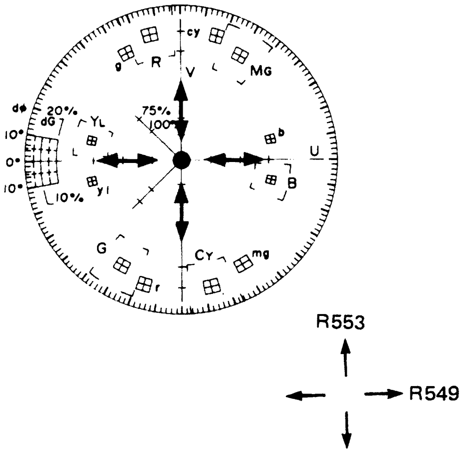
Notes: 1) Test pattern ilumination : Halogen lamps of 3,200°K
: More then 4,000 Lux
2) Pay careful attention that other light does not apply to the color sensor.

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
1	Preset Outdoor	Grey scale W. BAL. SW: OUTDOOR Color temperature conversion filter C14 → Lens	Vectorscope	R543 (PRESET R OUTDOOR) R527 (PRESET B OUTDOOR) $\boxed{2}\boxed{5}$ FAW	1) With C14 filter attached to the lens, pick up the grey scale. 2) Press the WHITE BALANCE switch to the mode for OUTDOOR (sunlight). 3) Adjust R543 and R527 alternately to position dots on the vectorscope in the center of the screen. 

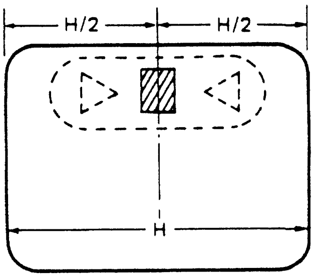
3.3.5 Auto white balance

Notes: 1) Test pattern ilumination : Halogen lamps of 3,200°K
: More then 4,000 Lux
2) Pay careful attention that other light does not apply to the color sensor.

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
1	(A) Indoor Limiter	Grey scale W. BAL. SW: AUTO mode Color temperature conversion filters W4 → Lens W14 → Sensor	Vectorscope	R515 (AW R INDOOR LIM) R534 (AW B INDOOR LIM) $\boxed{2}\boxed{5}$FAW	1) With the WHITE BALANCE switch pressed to be set for AUTO mode, pick up the grey scale. 2) Attach W4 filters to the lens and W14 filter to the sensor. 3) Adjust R515 and R534 alternately to position dots on the vectorscope in the center of the screen. 
	(B) Indoor Auto white	Grey scale W. BAL. SW: AUTO mode	Vectorscope	R503 (AW INDOOR B) R506 (AW INDOOR R) $\boxed{2}\boxed{5}$FAW	1) Press the WHITE BALANCE siwtch for AUTO mode and pick up the grey scale. 2) Adjust R503 and R506 alternately to position dots on the vectorscope in the center of the screen. 

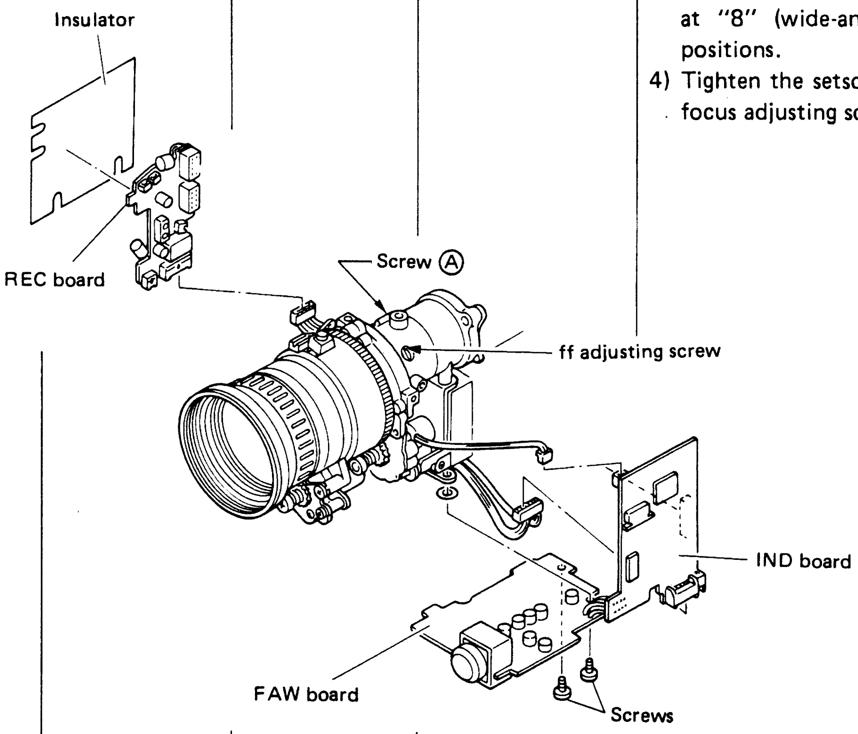
No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
2	(A) Outdoor Limiter	Grey scale W. BAL. SW: AUTO mode Color temperature conversion filters C16 → Lens C24 → Sensor	Vectorscope	R518 (AW R OUTDOOR LIM) R530 (AW B OUTDOOR LIM) $\boxed{2}\boxed{5}$FAW	1) With the WHITE BALANCE switch pressed to be set for AUTO mode, pick up the grey scale. 2) Attach C16 filter to the lens and C24 filter to the sensor. 3) Adjust R518 and R530 alternately to position dots on the vectorscope in the center of the screen. 
	(B) Outdoor Auto white	Grey scale W. BAL. SW: AUTO mode Color temperature conversion filters C14 → Lens & Sensor	Vectorscope	R553 (AW R GAIN) R549 (AW B GAIN) $\boxed{2}\boxed{5}$ FAW	1) With C14 filters attached to the lens and the sensor, pick up the grey scale. 2) Press the WHITE BALANCE switch to set the mode for AUTO. 3) Adjust R553 and R549 alternately to position dots on the vectorscope in the center of the screen. 

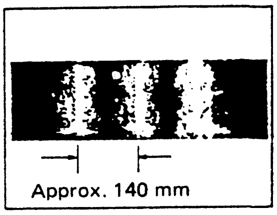
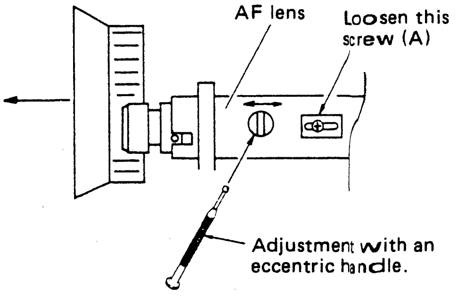
3.3.6 Focus indicator position

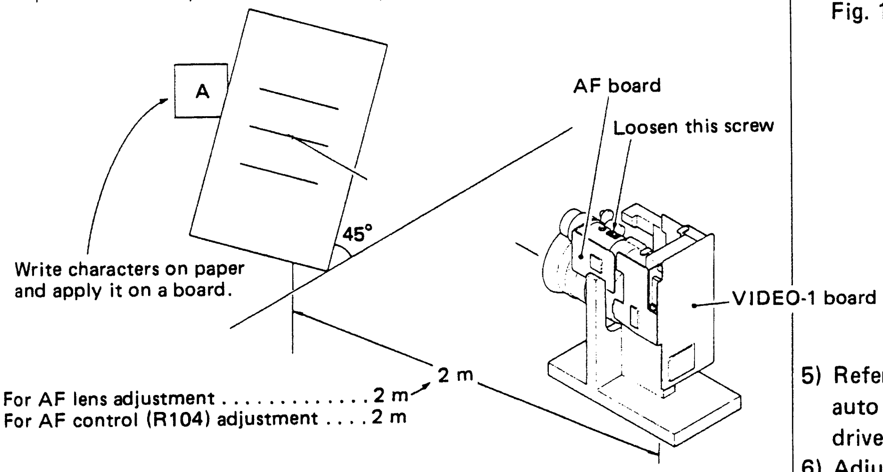
No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
1	Indicator Adjust	Lens closed	Electronic Viewfinder	R402 (IND OSC.) $\boxed{2}\boxed{4}$ INDICATOR	1) Adjust R402 (IND OSC) so that the indicator inside the electronic viewfinder is positioned at the center. 

3.3.7 Auto focus

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
1	Back Focus	Subject in the distance of 3 m Iris: Opened ND filter	VIDEO OUT (on Monitor)	Master Lens	● **Preparation** 1. Attach a proper ND filter to open the iris fully in the daylight. If the monitor screen is dark, the iris is fully opened. 2. If it would be still bright, attach additional ND filter(s) to cut the incident light and confirm that the brightness of the image does not vary by changing the iris set position. ● **Adjustment** 1) Loosen the setscrew Ⓐ, and slowly turn the ff adjusting screw to focus the lens observing the monitor. 2) Set the zoom lens at "48" graduation and confirm that the subject is in focus. 3) Set the lens focus at "3 m" graduation and shoot a subject in the distance of 3 m away. In this state, confirm that the picture is in focus in two ways that the zoom lens is set at "8" (wide-angle) and "48" (telephoto) positions. 4) Tighten the setscrew Ⓐ, and lock the back-focus adjusting screw.

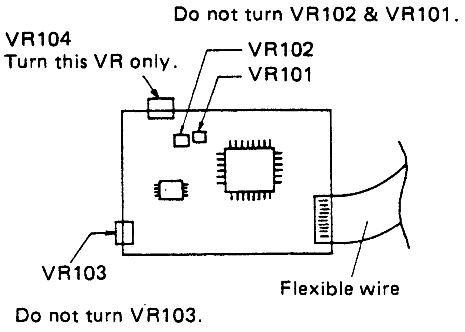
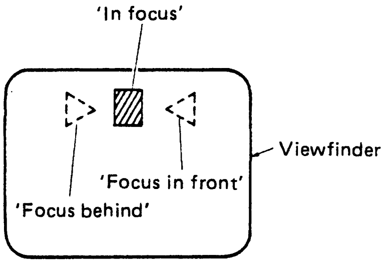


No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
2	Auto Focus Pint Bias	LUX, 3200 2 meters Focus SW AUTO Auto Focus Puttern	Monitor TV	Mastor Lens	Before performing auto focus adjustment, be sure to confirm correct back focus adjustment of the video system. 1) Set for about 2 meters between the lens and auto focus chart. 2) Connect viewfinder to CN6 to the 02 VIDEO board. Observe the viewfinder picture. 3) Connect viewfinder to CN410 of the 24 Indicator board. Confirm that indications are produced in the viewfinder. 4) Pick up the auto focus chart as illustrated in Fig. 1.  Approx. 140 mm **Fig. 1** AF adjustment chart 5) Refer to Fig. 2. Loosen screw (A) of the auto focus unit. Then insert the eccentric driver into the master lens hole. 6) Adjust repeatedly for both auto and manual settings. Confirm that front focus, exact focus, and rear focus indications appear. After adjusting, carefully tighten screw (A).  AF lens Loosen this screw (A) Adjustment with an eccentric handle. **Fig. 2**


A
Write characters on paper and apply it on a board.
45°
AF board
Loosen this screw
VIDEO-1 board
2 m

For AF lens adjustment . . . . 2 m
For AF control (R104) adjustment . . . . 2 m

Fig. 3 Setup for AF adjustment

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
3	Pint Bias	LUX, 500 2 meters FOCUS SW AUTO Auto Focus Puttern	Monitor TV Write characters on paper and apply it on a board	VR104 (Pint Bias) AUTO FOCUS board	1) As shown in Fig. 4, observe the characters of the auto focus chart and adjust the focus with VR104.  Do not turn VR102 & VR101. VR104 Turn this VR only. VR102 VR101 VR103 Flexible wire Do not turn VR103. **Fig. 4** 2) After adjusting, operate the FOCUS switch between Auto and Manual positions and confirm correct focus.  'In focus' Viewfinder 'Focus in front' 'Focus behind' **Fig. 5**

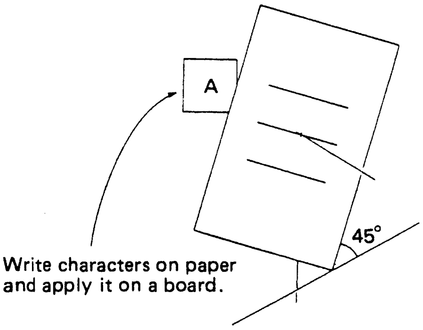

A
45°
Write characters on paper and apply it on a board.

Fig. 6

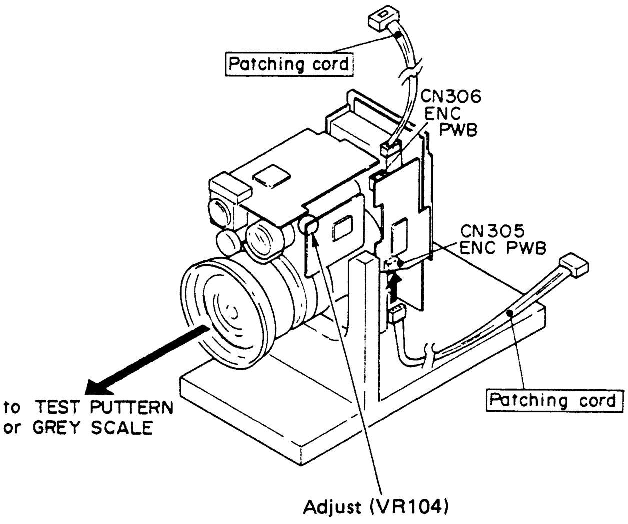
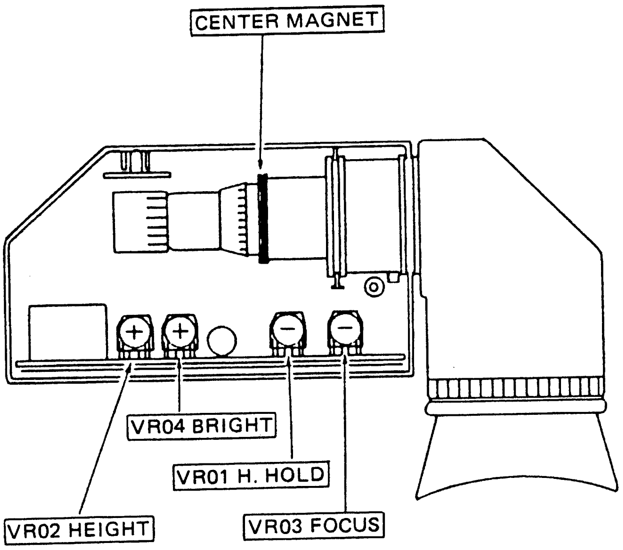
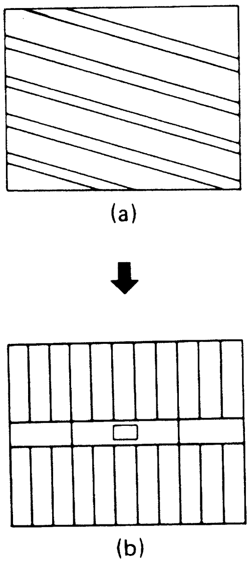

Patching cord
CN306
ENC
PWB
CN305
ENC PWB
Patching cord
to TEST PUTTERN
or GREY SCALE
Adjust (VR104)

Fig. 7

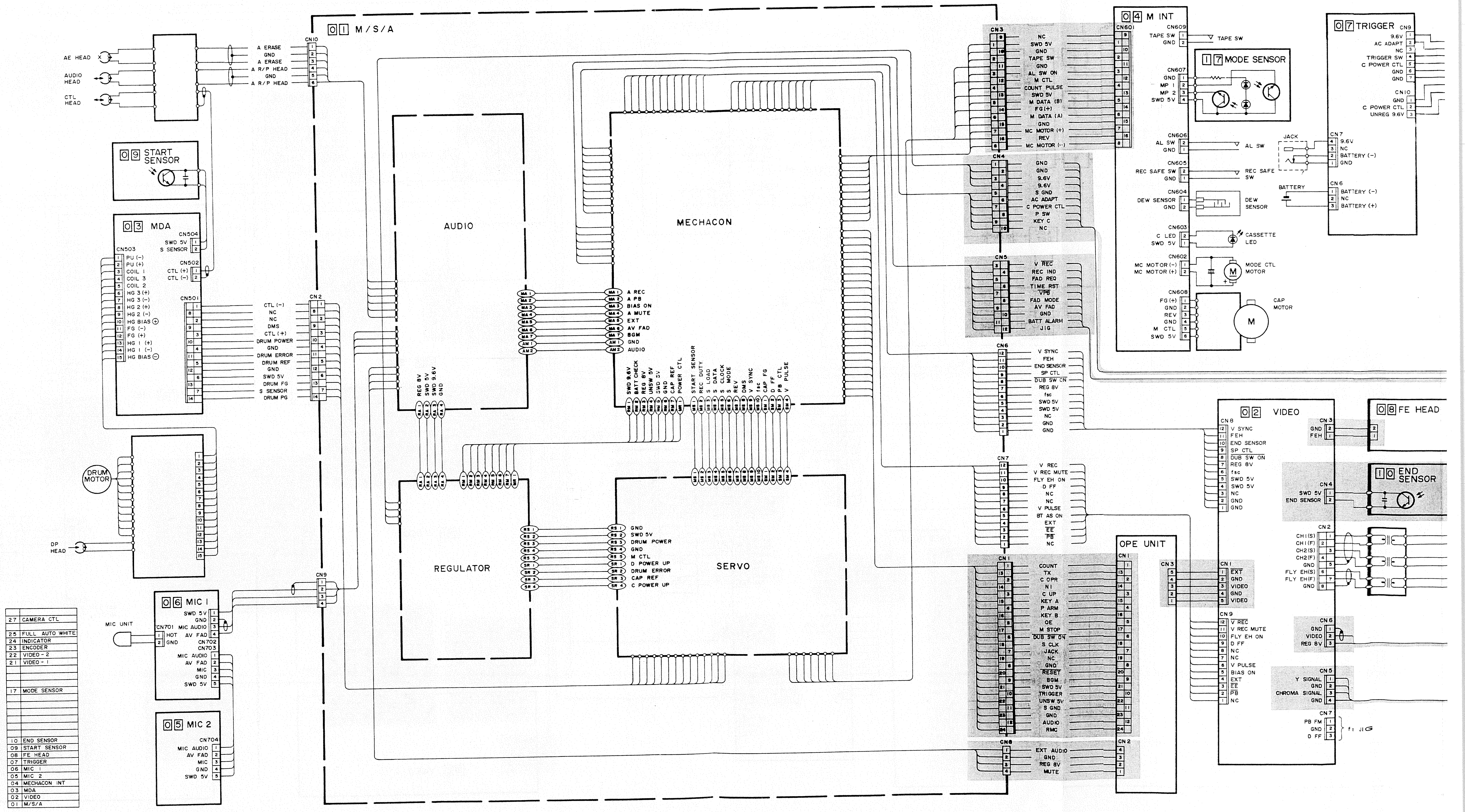
3.3.8 Electronic viewfinder (EVF) adjustment

Caution: High voltage appears at the CRT anode, HV module, etc.

No.	Item	Signal & Mode	Check Point	Adjustment Parts	Adjustment & Checkup
1	Horizontal Sync.	Grey scale or Monoscope	EVF (CRT)	VR01 (H. HOLD) [7][1] VF BOARD  CENTER MAGNET VR04 BRIGHT VR01 H. HOLD VR02 HEIGHT VR03 FOCUS	1) Observing the viewfinder, turn VR01 fully clockwise to make unstable pictures. 2) Gradually turn VR01 counterclockwise until the picture becomes stable. When the picture is completely stabilized, mark the VR position with a felt pen or the like for further reference. 3) Next, turn VR01 fully counterclockwise to make the picture unstable again. 4) Turn VR01 gradually clockwise until the picture is stabilized. Mark the VR position in the same manner as in 2) above. 5) Set VR01 at the midpoint between the two markings.  (a) (b)
2	Vertical Scanning	Grey scale or Monoscope	EVF (CRT)	VR02 (HEIGHT) [7][1] VF BOARD	1) Observing the viewfinder, adjust VR02 for normal picture amplitude.
3	Centering	Grey scale	EVF (CRT)	CENTER MAGNET	1) Pick up the grey scale to locate it at the center of TV picture, adjust the centering magnet so that image of the grey scale is positioned at the center of the viewfinder screen.
4	Focus	Grey scale	EVF (CRT)	VR03 (FOCUS) [7][1] VF BOARD	1) Observing the viewfinder, adjust VR03 to obtain aclear picture of the center part of the grey scale image.
5	Brightness	Iris closed (Lens capped)	EVF (CRT)	VR04 (BRIGHT) [7][1] VF BOARD	1) With the iris closed, adjust VR04 so that the CRT raster of the viewfinder is just barely visible.

SECTION 4
OVERALL WIRING AND BLOCK DIAGRAMS

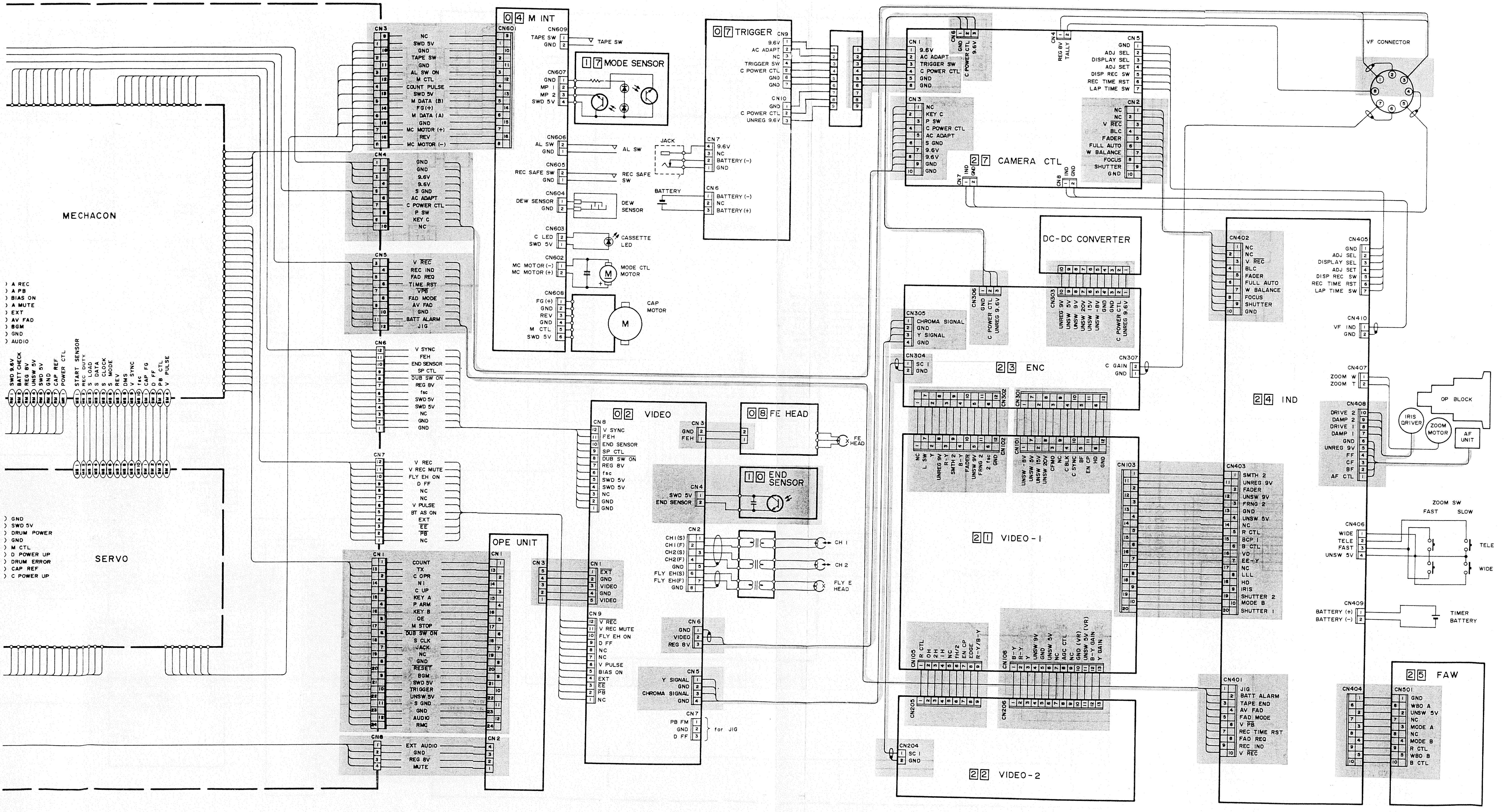
4.1 OVERALL WIRING



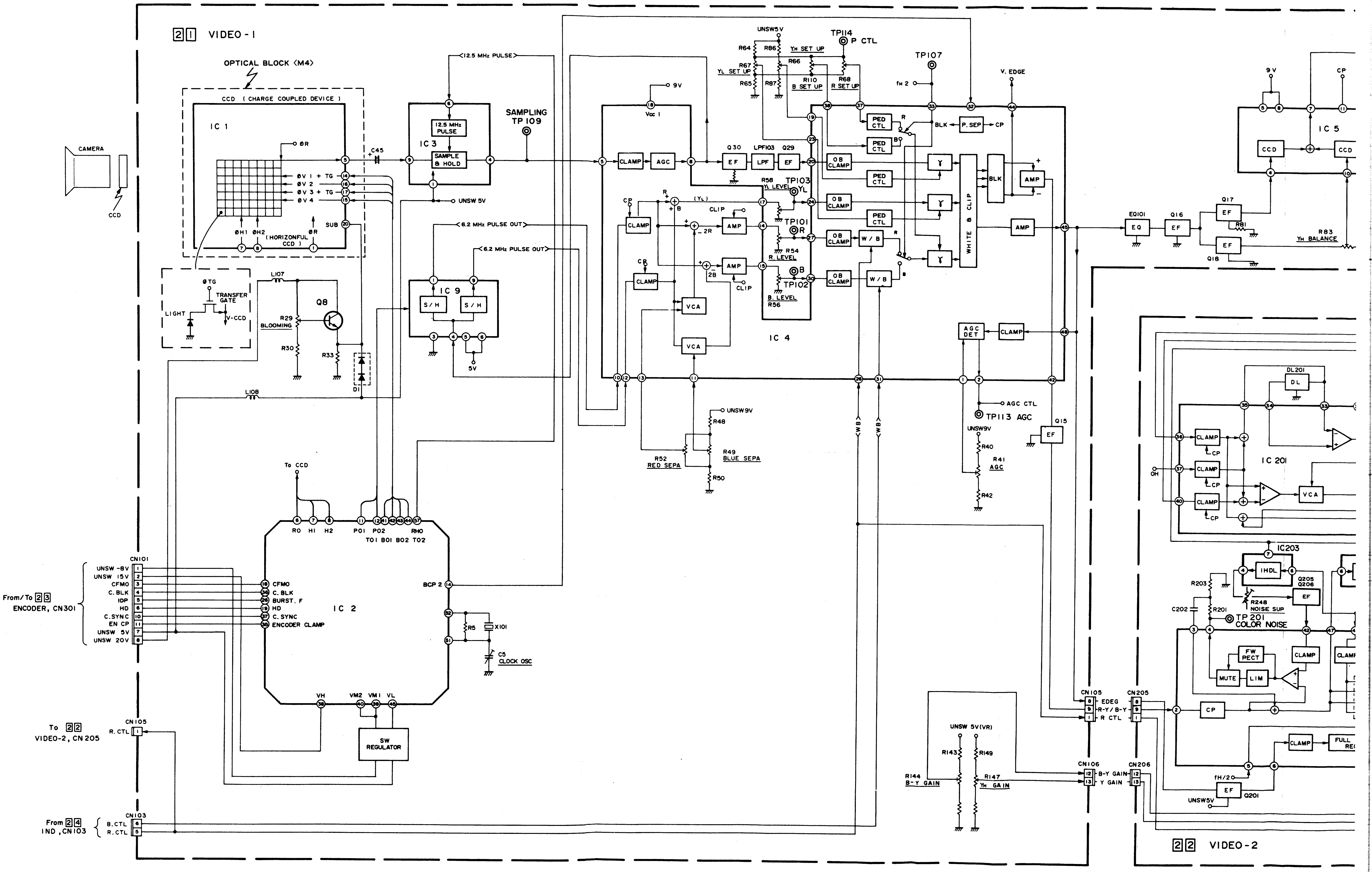
01 M/S/A
AUDIO
MECHACON
REGULATOR
SERVO
02 VIDEO
03 MDA
04 M INT
05 MIC 2
06 MIC 1
07 TRIGGER
08 FE HEAD
09 START SENSOR
10 END SENSOR
17 MODE SENSOR
OPE UNIT
AE HEAD
AUDIO HEAD
CTL HEAD
DRUM MOTOR
DP HEAD
MIC UNIT
CAP MOTOR
MODE CTL MOTOR
CASSETTE LED
DEW SENSOR
TAPE SW
AL SW
REC SAFE SW
JACK
BATTERY
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN8
CN9
CN10
CN501
CN502
CN503
CN504
CN601
CN602
CN603
CN604
CN605
CN606
CN607
CN608
CN609
CN701
CN702
CN703
CN704
A ERASE
GND
A R/P HEAD
SWD 5V
S SENSOR
CTL (+)
CTL (−)
PU (−)
PU (+)
COIL 1
COIL 3
COIL 2
HG 3 (+)
HG 3 (−)
HG 2 (+)
HG 2 (−)
HG BIAS ⊕
FG (−)
FG (+)
HG 1 (+)
HG 1 (−)
HG BIAS ⊖
NC
DMS
DRUM POWER
DRUM ERROR
DRUM REF
DRUM FG
S SENSOR
DRUM PG
A REC
A PB
BIAS ON
A MUTE
EXT
AV FAD
BGM
AUDIO
REG 8V
SWD 5V
SWD 9.6V
GND
SWD 9.6V
BATT CHECK
UNSW 5V
CAP REF
POWER CTL
START SENSOR
REC DUTY
S LOAD
S DATA
S CLOCK
S MODE
REV
DMS
V SYNC
fsc
CAP FF
CTL
PB
V PULSE
M CTL
D POWER UP
C POWER UP
TAPE SW
AL SW ON
M CTL
COUNT PULSE
M DATA (B)
FG (+)
M DATA (A)
MC MOTOR (+)
REV
MC MOTOR (−)
9.6V
S GND
AC ADAPT
C POWER CTL
P SW
KEY C
V REC
REC IND
FAD REQ
TIME RST
VPB
FAD MODE
AV FAD
BATT ALARM
JIG
FEH
END SENSOR
SP CTL
DUB SW ON
REG 8V
V REC MUTE
FLY EH ON
D FF
V PULSE
BT AS ON
EE
COUNT
TX
C OPR
NI
C UP
KEY A
P ARM
KEY B
OE
M STOP
DUB SW ON
S CLK
JACK
RESET
BGM
TRIGGER
UNSW 5V
S GND
RMC
EXT AUDIO
REG 8V
MUTE
MP 1
MP 2
C LED
MC MOTOR (−)
MC MOTOR (+)
TRIGGER SW
UNREG 9.6V
BATTERY (−)
BATTERY (+)
VIDEO
CH1(S)
CH1(F)
CH2(S)
CH2(F)
FLY EH(S)
FLY EH(F)
Y SIGNAL
CHROMA SIGNAL
PB FM
f1 JIG
MIC AUDIO
HOT
AV FAD
MIC

27	CAMERA CTL
25	FULL AUTO WHITE
24	INDICATOR
23	ENCODER
22	VIDEO - 2
21	VIDEO - 1
17	MODE SENSOR
10	END SENSOR
09	START SENSOR
08	FE HEAD
07	TRIGGER
06	MIC 1
05	MIC 2
04	MECHACON INT
03	MDA
02	VIDEO
01	M/S/A

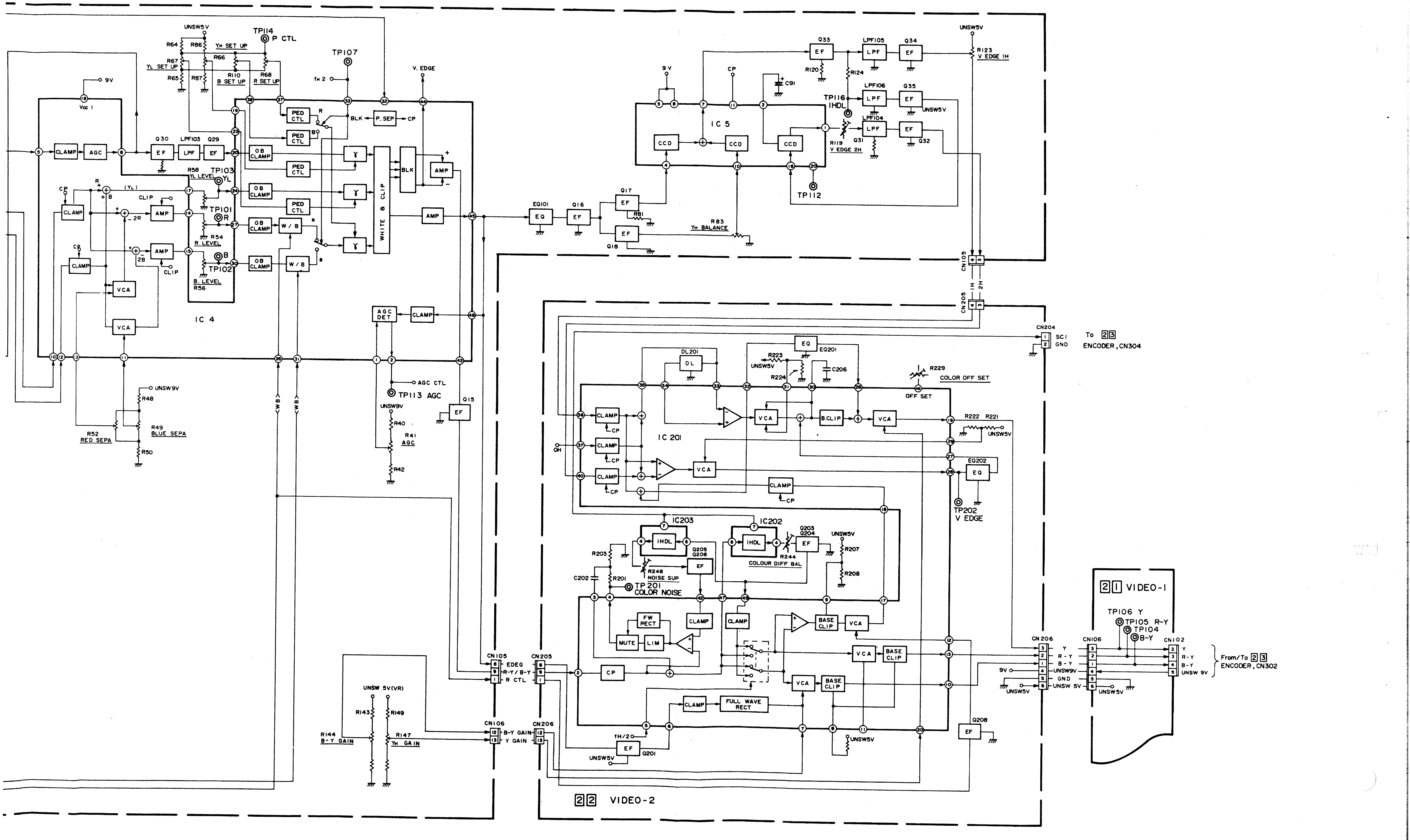
SECTION 4
IRING AND BLOCK DIAGRAMS


MECHACON
SERVO
A REC
A PB
BIAS ON
A MUTE
EXT
AV FAD
BGM
GND
AUDIO
GND
SWD 5V
DRUM POWER
GND
M CTL
D POWER UP
DRUM ERROR
CAP REF
C POWER UP
SWD 9.6V
BATT CHECK
REG 8V
UNSW 5V
SWD 5V
GND
CAP REF
POWER CTL
START SENSOR
REC DUTY
S LOAD
S DATA
S CLOCK
S MODE
REV
DMS
V SYNC
fsc
CAP FG
D FF
PB CTL
V PULSE
CN3
NC
SWD 5V
GND
TAPE SW
GND
AL SW ON
M CTL
COUNT PULSE
SWD 5V
M DATA (B)
FG(+)
M DATA (A)
GND
MC MOTOR (+)
REV
MC MOTOR (-)
CN4
GND
GND
9.6V
9.6V
S GND
AC ADAPT
C POWER CTL
P SW
KEY C
NC
CN5
V REC
REC IND
FAD REQ
TIME RST
VPB
FAD MODE
AV FAD
GND
BATT ALARM
JIG
CN6
V SYNC
FEH
END SENSOR
SP CTL
DUB SW ON
REG 8V
fsc
SWD 5V
SWD 5V
NC
GND
GND
CN7
V REC
V REC MUTE
FLY EH ON
D FF
NC
NC
V PULSE
BT AS ON
EXT
EE
PB
NC
CN1
COUNT
TX
C OPR
NI
C UP
KEY A
P ARM
KEY B
OE
M STOP
DUB SW ON
S CLK
JACK
NC
GND
RESET
BGM
SWD 5V
TRIGGER
UNSW 5V
S GND
AUDIO
RMC
CN8
EXT AUDIO
GND
REG 8V
MUTE
04 M INT
CN601
CN609
TAPE SW
GND
TAPE SW
17 MODE SENSOR
CN607
GND
MP 1
MP 2
SWD 5V
CN606
AL SW
GND
AL SW
CN605
REC SAFE SW
GND
REC SAFE SW
CN604
DEW SENSOR
GND
DEW SENSOR
CN603
C LED
SWD 5V
CASSETTE LED
CN602
MC MOTOR (-)
MC MOTOR (+)
MODE CTL MOTOR
CN608
FG (+)
GND
REV
GND
M CTL
SWD 5V
CAP MOTOR
M
07 TRIGGER
CN9
9.6V
AC ADAPT
NC
TRIGGER SW
C POWER CTL
GND
GND
CN10
GND
C POWER CTL
UNREG 9.6V
JACK
CN7
9.6V
NC
BATTERY (-)
GND
BATTERY
CN6
BATTERY (-)
NC
BATTERY (+)
OPE UNIT
CN1
CN2
CN3
02 VIDEO
CN8
V SYNC
FEH
END SENSOR
SP CTL
DUB SW ON
REG 8V
fsc
SWD 5V
SWD 5V
NC
GND
GND
CN1
EXT
GND
VIDEO
GND
VIDEO
CN9
V REC
V REC MUTE
FLY EH ON
D FF
NC
NC
V PULSE
BIAS ON
EXT
EE
PB
NC
CN3
GND
FEH
08 FE HEAD
FE HEAD
CN4
SWD 5V
END SENSOR
10 END SENSOR
CN2
CH1(S)
CH1(F)
CH2(S)
CH2(F)
GND
FLY EH(S)
FLY EH(F)
GND
CH 1
CH 2
FLY E HEAD
CN6
GND
VIDEO
REG 8V
CN5
Y SIGNAL
GND
CHROMA SIGNAL
GND
CN7
PB FM
GND
D FF
for JIG
27 CAMERA CTL
CN1
9.6V
AC ADAPT
TRIGGER SW
C POWER CTL
GND
GND
CN6
GND
C POWER CTL
9.6V
CN4
REG 8V
TALLY
CN5
GND
ADJ SEL
DISPLAY SEL
ADJ SET
DISP REC SW
REC TIME RST
LAP TIME SW
CN3
NC
KEY C
P SW
C POWER CTL
AC ADAPT
S GND
9.6V
9.6V
GND
GND
CN2
NC
NC
V REC
BLC
FADER
FULL AUTO
W BALANCE
FOCUS
SHUTTER
GND
CN7
IND
GND
CN8
IND
GND
VF CONNECTOR
DC-DC CONVERTER
23 ENC
CN305
CHROMA SIGNAL
GND
Y SIGNAL
GND
CN304
SC I
GND
CN306
GND
C POWER CTL
UNREG 9.6V
CN303
UNREG 9V
UNSW 5V
UNSW 9V
UNSW 20V
UNSW 15V
UNSW -8V
GND
GND
C POWER CTL
UNREG 9.6V
CN307
C GAIN
GND
CN302
CN301
21 VIDEO-1
CN102
NC
L SW
Y
UNREG 9V
R-Y
SMTH 2
R-Y
FADER
UNSW 9V
FRNG 1
fsc
2
GND
CN101
UNSW -8V
UNSW 9V
UNSW 15V
UNSW 20V
CFMO
NC
C BLK
C SYNC
BF
EN CP
EN CP
GND
CN103
CN105
R CTL
R OH
2H
1H
NC
fH/2
EN CP
EDGE
R-Y/B-Y
CN106
B-Y
R-Y
UNSW 9V
GND
UNSW 5V
NC
AGC CTL
NC
GND (VR)
UNSW 5V (VR)
B-Y GAIN
R-Y GAIN
Y GAIN
22 VIDEO-2
CN205
CN206
CN204
SC I
GND
24 IND
CN402
NC
NC
V REC
BLC
FADER
FULL AUTO
W BALANCE
FOCUS
SHUTTER
GND
CN405
GND
ADJ SEL
DISPLAY SEL
ADJ SET
DISP REC SW
REC TIME RST
LAP TIME SW
CN410
VF IND
GND
CN407
ZOOM W
ZOOM T
OP BLOCK
IRIS DRIVER
ZOOM MOTOR
AF UNIT
CN408
DRIVE 2
DAMP 2
DRIVE 1
DAMP 1
GND
UNREG 9V
FF
CF
BF
AF CTL
CN403
SMTH 2
UNREG 9V
FADER
UNSW 9V
FRNG 2
GND
UNSW 5V
NC
R CTL
BCP I
B CTL
VD
EE-Y
NC
LLL
HD
IRIS
SHUTTER 2
MODE B
SHUTTER 1
ZOOM SW
FAST
SLOW
CN406
WIDE
TELE
FAST
UNSW 5V
TELE
WIDE
CN409
BATTERY (+)
BATTERY (-)
TIMER BATTERY
CN401
JIG
BATT ALARM
TAPE END
AV FAD
FAD MODE
V PB
REC TIME RST
FAD REQ
REC IND
V REC
CN404
25 FAW
CN501
GND
WBO A
UNSW 5V
NC
MODE A
NC
MODE B
R CTL
WBO B
B CTL

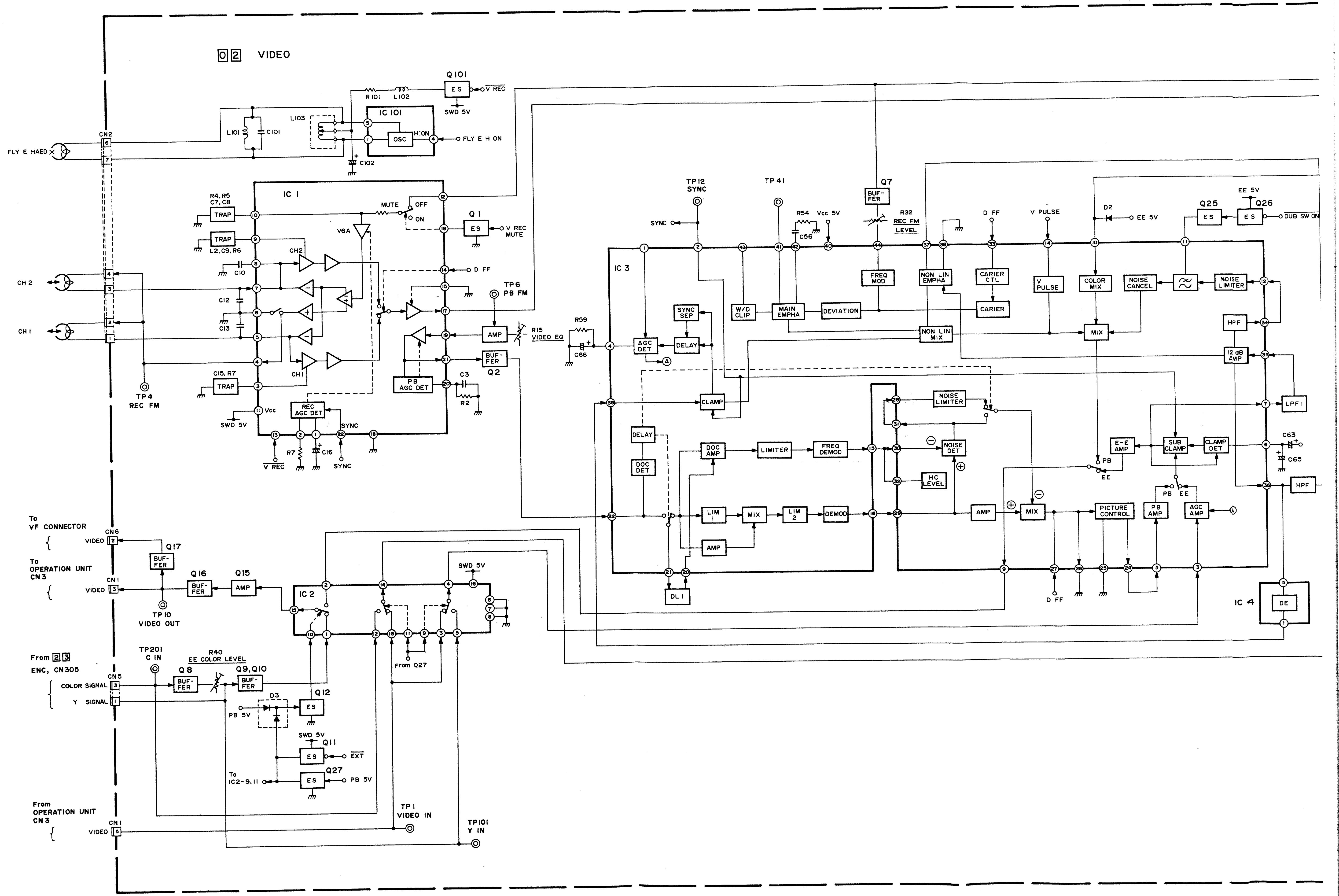
4.2 VIDEO (CAMERA) BLOCK DIAGRAM

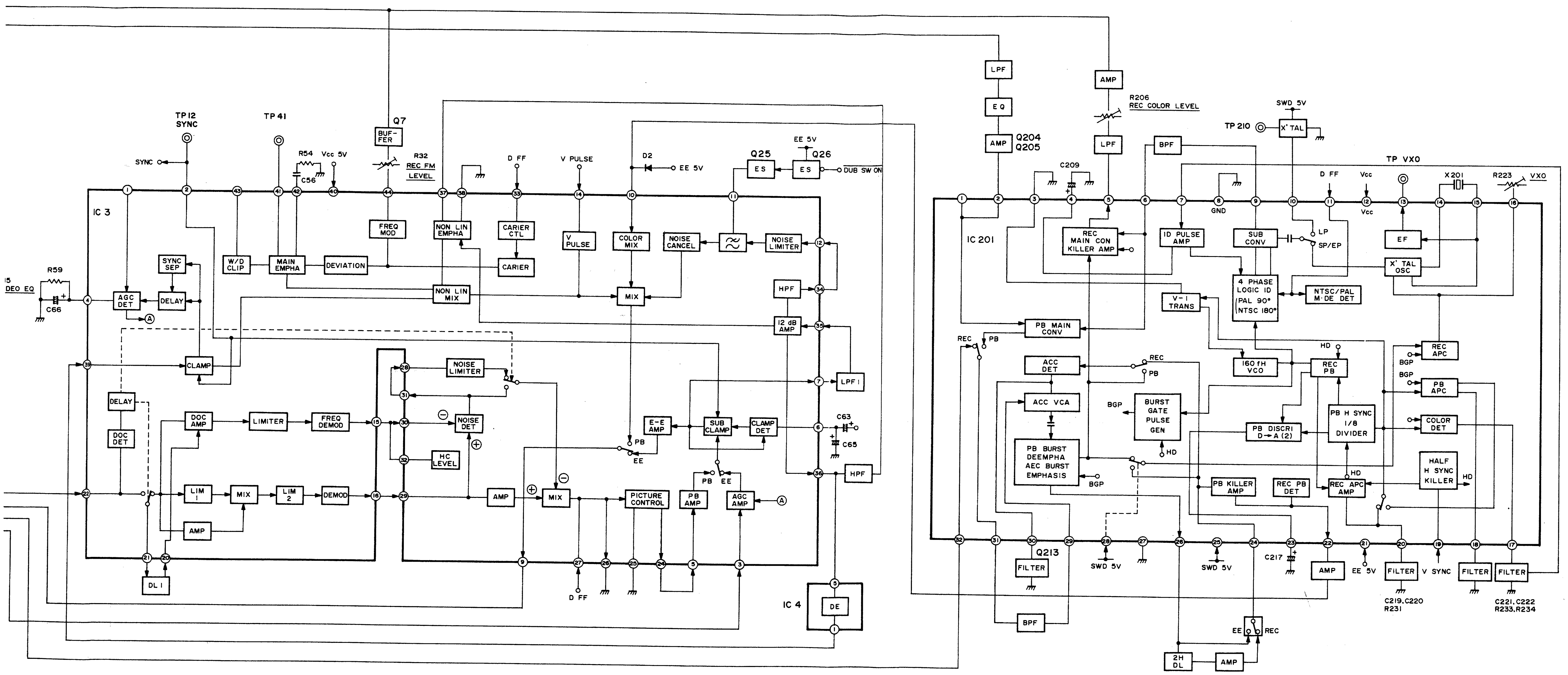


21 VIDEO-1
OPTICAL BLOCK (M4)
CCD (CHARGE COUPLED DEVICE)
IC 1
ØR
ØV 1 + TG
ØV 2
ØV 3 + TG
ØV 4
SUB
ØH1 ØH2 (HORIZONFUL CCD)
CAMERA
CCD
ØTG
TRANSFER GATE
LIGHT
V-CCD
L107
Q8
R29 BLOOMING
R30
R33
D1
L108
C45
12.5 MHz PULSE
IC 3
12.5 MHz PULSE
SAMPLE & HOLD
UNSW 5V
SAMPLING TP 109
6.2 MHz PULSE OUT
IC 9
S/H
5V
To CCD
IC 2
RO H1 H2 PO1 PO2 RHO
TO1 BO1 BO2 TO2
CFMO
C.BLK
BURST. F
HD
C.SYNC
ENCODER CLAMP
BCP 2
R5
X101
C5 CLOCK OSC
VH VM2 VM1 VL
SW REGULATOR
CN101
UNSW -8V
UNSW 15V
CFMO
C.BLK
IDP
HD
C.SYNC
EN CP
UNSW 5V
UNSW 20V
From/To 23 ENCODER, CN301
To 22 VIDEO-2, CN205
CN105
R.CTL
From 24 IND, CN103
CN103
B.CTL
R.CTL
9V
Vcc 1
CLAMP
AGC
UNSW5V
R64 R86 YH SET UP
R67 YL SET UP
R66
R65 R87
R110 B SET UP
R68 R SET UP
TP114 P CTL
TP107
fH 2
V. EDGE
Q30 LPF103 Q29
EF LPF EF
R58 YL LEVEL
TP103 YL
(YL)
CLIP
AMP
TP101 R
R54 R. LEVEL
B
TP102
B. LEVEL R56
2R
2B
VCA
IC 4
OB CLAMP
PED CTL
W/B
BLK
P. SEP
CP
γ
WHITE & CLIP
AMP
UNSW9V
R48
R49 BLUE SEPA
R52 RED SEPA
R50
WB
AGC DET
AGC CTL
TP113 AGC
UNSW9V
R40
R41 AGC
R42
Q15
EF
EQ101
EQ
Q16
Q17
R81
R83 YH BALANCE
Q18
9V
IC 5
CCD
CN105
EDEG
R-Y/B-Y
R CTL
CN205
CN106
B-Y GAIN
Y GAIN
CN206
UNSW 5V(VR)
R143 R149
R144 B-Y GAIN
R147 YH GAIN
DL201
DL
IC 201
ØH
IC203
IHDL
Q205 Q206
R203
R248 NOISE SUP
C202
R201
TP 201 COLOR NOISE
FW RECT
MUTE
LIM
fH/2
UNSW5V
Q201
FULL
22 VIDEO-2

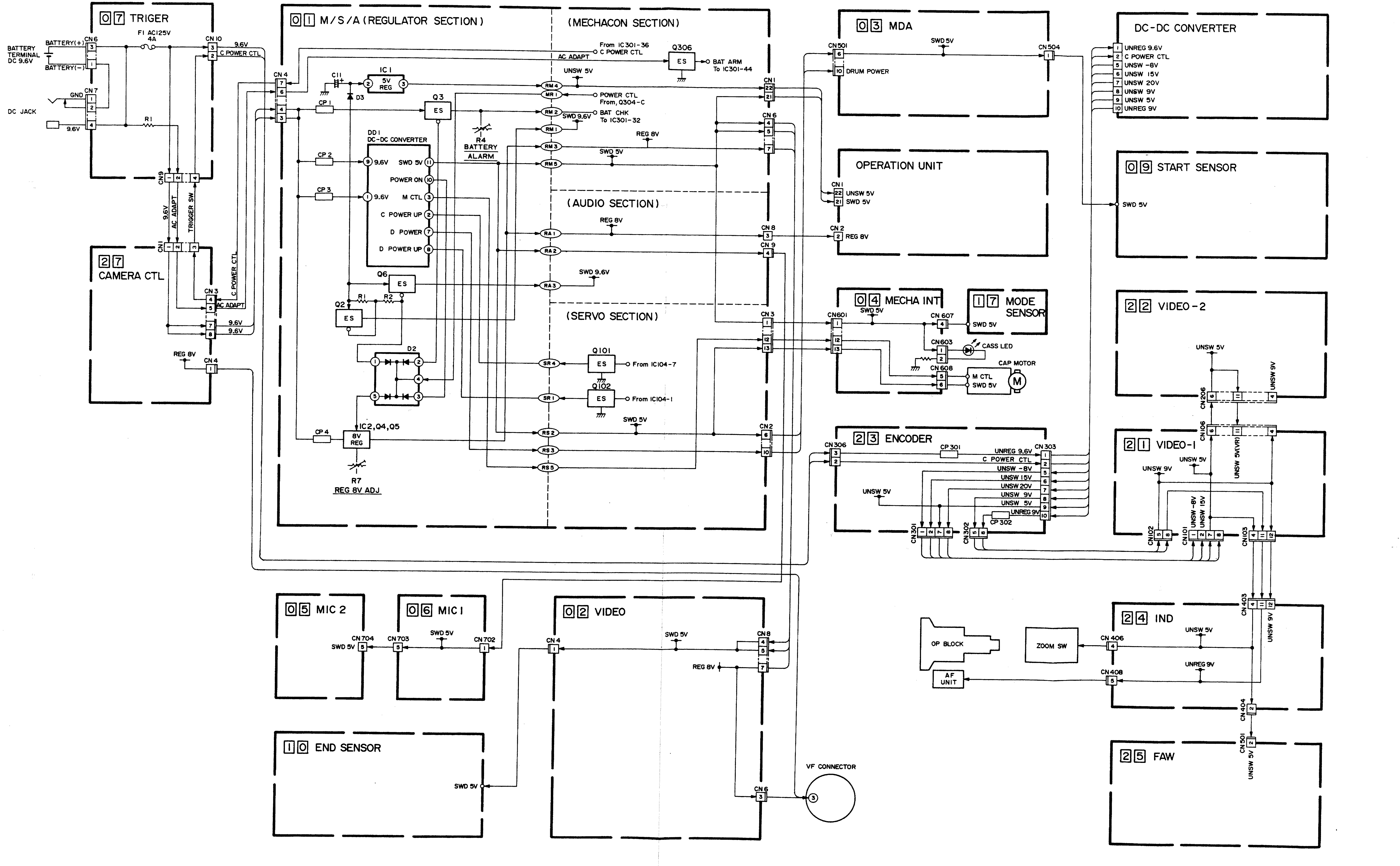

UNSW5V
TP114 P CTL
TP107
fH 2
V. EDGE
R64 R86 YH SET UP
R67 R66
YL SET UP
R65 R87 R110 B SET UP R68 R SET UP
9V
Vcc 1
PED CTL
BLK
P. SEP
CP
CLAMP
AGC
Q30 LPF103 Q29
EF LPF EF
OB CLAMP
γ
WHITE & CLIP
AMP
R58 YL LEVEL
TP103 YL
TP101 R
R54 R LEVEL
TP102 B
B. LEVEL R56
CLIP
W / B
VCA
IC 4
AGC DET
TP113 AGC
AGC CTL
UNSW9V
R40
R41 AGC
R42
Q15
EF
R48
R49 BLUE SEPA
R52 RED SEPA
R50
WB
EQ101 Q16 Q17
EQ EF EF
R81
Q18
R83 YH BALANCE
TP112
IC 5
CCD
C91
Q33 LPF105 Q34
R120 R124
TP116 1HDL
LPF106 Q35
LPF104
R119 V EDGE 2H
Q31 Q32
R123 V EDGE 1H
CN105
CN205
1H 2H
CN204
SC1
GND
To 23 ENCODER, CN304
DL201
EQ201
R223
R224
C206
R229 COLOR OFF SET
OFF SET
IC 201
B.CLIP
R222 R221
EQ202
TP202 V EDGE
IC203 IC202
1HDL
Q205 Q206
Q203 Q204
R203
R248 NOISE SUP
R201
C202
TP 201 COLOR NOISE
R244 COLOUR DIFF BAL
R207 R208
FW RECT
MUTE LIM
BASE CLIP
CP
FULL WAVE RECT
1H/2
Q201
Q208
CN105 EDEG R-Y/B-Y R CTL
CN205
CN106 CN206
B-Y GAIN
Y GAIN
UNSW 5V(VR)
R143 R149
R144 B-Y GAIN
R147 YH GAIN
CN 206
Y R-Y B-Y UNSW9V GND UNSW 5V
CN106
CN102
Y R-Y B-Y UNSW 9V
21 VIDEO-1
TP106 Y
TP105 R-Y
TP104
B-Y
From/To 23 ENCODER, CN302
22 VIDEO-2

4.3 VIDEO (DECK) BLOCK DIAGRAM


02 VIDEO
Q101
ES
V REC
SWD 5V
R101
L102
IC 101
OSC
H:ON
FLY E H ON
L103
L101
C101
C102
CN2
FLY E HAED
IC 1
R4, R5
C7, C8
TRAP
L2, C9, R6
C10
C12
C13
C15, R7
MUTE
OFF
ON
V6A
CH2
CH1
Q1
V REC MUTE
D FF
TP6
PB FM
AMP
R15
VIDEO EQ
BUF-FER
Q2
PB AGC DET
REC AGC DET
C3
R2
Vcc
SWD 5V
SYNC
R7
C16
V REC
CH 2
CH 1
TP4
REC FM
TP12
SYNC
TP41
R54
Vcc 5V
C56
Q7
BUF-FER
R32
REC FM LEVEL
D FF
V PULSE
D2
EE 5V
Q25
Q26
DUB SW ON
IC 3
SYNC SEP
DELAY
AGC DET
R59
C66
W/D CLIP
MAIN EMPHA
DEVIATION
FREQ MOD
NON LIN EMPHA
CARIER CTL
CARIER
NON LIN MIX
V PULSE
COLOR MIX
NOISE CANCEL
NOISE LIMITER
MIX
HPF
12 dB AMP
LPF I
CLAMP
NOISE LIMITER
DELAY
DOC DET
DOC AMP
LIMITER
FREQ DEMOD
NOISE DET
HC LEVEL
E-E AMP
SUB CLAMP
CLAMP DET
C63
C65
PB
EE
LIM 1
MIX
LIM 2
DEMOD
AMP
MIX
PICTURE CONTROL
PB AMP
AGC AMP
HPF
AMP
DL I
D FF
IC 4
DE
To VF CONNECTOR
CN6
VIDEO
Q17
BUF-FER
To OPERATION UNIT CN3
CN1
VIDEO
Q16
BUF-FER
Q15
AMP
TP10
VIDEO OUT
IC 2
SWD 5V
From Q27
From 23 ENC, CN305
CN5
COLOR SIGNAL
Y SIGNAL
TP201
C IN
R40
EE COLOR LEVEL
Q8
BUF-FER
Q9, Q10
BUF-FER
D3
PB 5V
Q12
ES
SWD 5V
Q11
ES
EXT
To IC2-9, 11
Q27
ES
PB 5V
From OPERATION UNIT CN3
CN1
VIDEO
TP1
VIDEO IN
TP101
Y IN

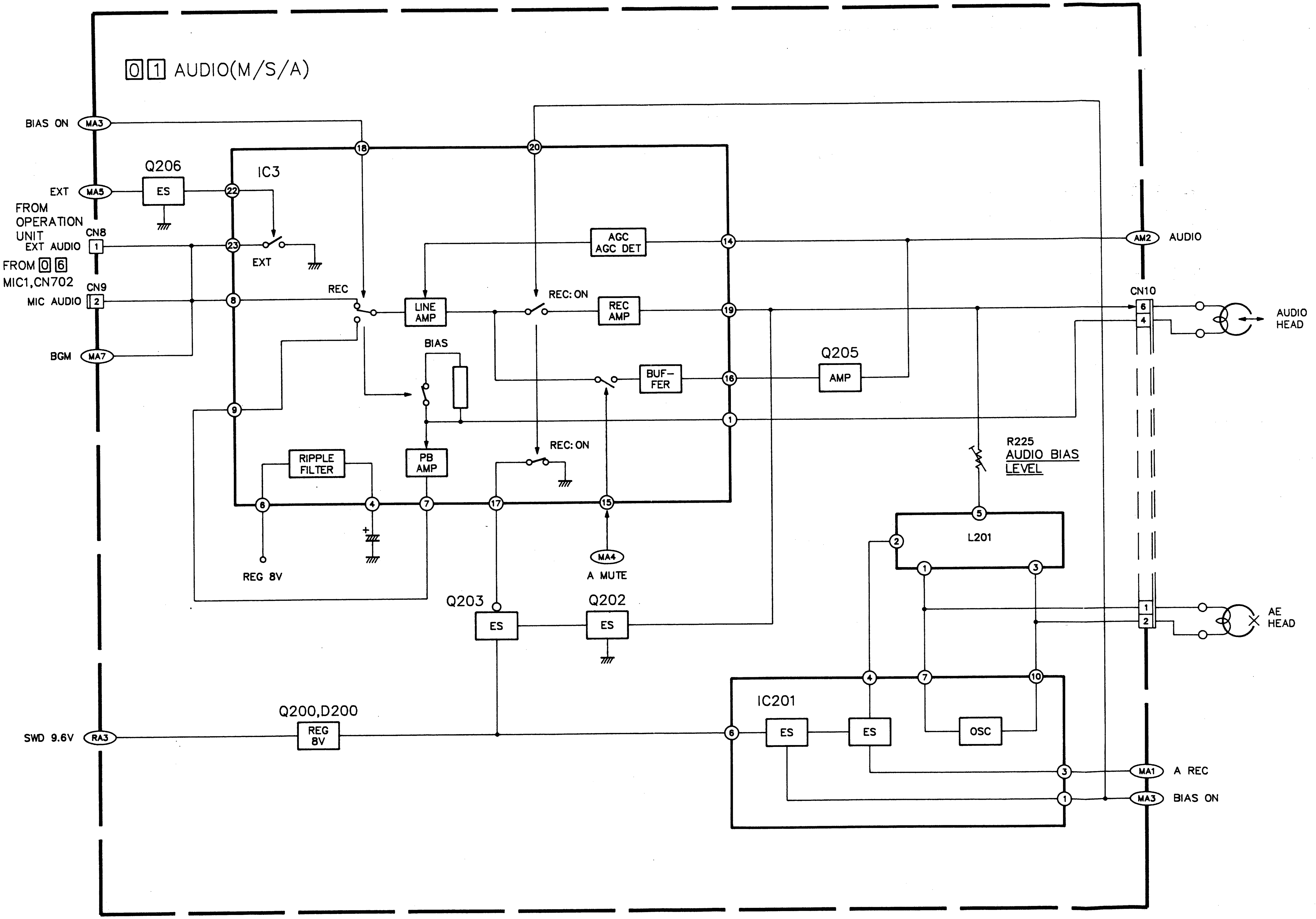

IC 3
IC 4
IC 201
TP12 SYNC
TP 41
SYNC
R54
Vcc 5V
C56
Q7
BUF-FER
R32 REC FM LEVEL
D FF
V PULSE
D2
EE 5V
Q25
Q26
ES
DUB SW ON
15 DEO EQ
R59
C66
AGC DET
SYNC SEP
DELAY
W/D CLIP
MAIN EMPHA
DEVIATION
FREQ MOD
NON LIN EMPHA
CARIER CTL
CARIER
NON LIN MIX
V PULSE
COLOR MIX
NOISE CANCEL
NOISE LIMITER
MIX
HPF
12 dB AMP
CLAMP
NOISE LIMITER
NOISE DET
HC LEVEL
DOC AMP
LIMITER
FREQ DEMOD
DOC DET
LIM 1
MIX
LIM 2
DEMOD
AMP
DL I
AMP
MIX
PICTURE CONTROL
PB AMP
AGC AMP
E-E AMP
SUB CLAMP
CLAMP DET
LPF I
C63
C65
HPF
PB
EE
DE
D FF
LPF
EQ
AMP
Q204 Q205
AMP
R206 REC COLOR LEVEL
LPF
BPF
SWD 5V
TP 210
X' TAL
C209
REC MAIN CON KILLER AMP
ID PULSE AMP
GND
SUB CONV
LP
SP/EP
D FF
Vcc
TP VXO
X201
R223
VXO
EF
X' TAL OSC
4 PHASE LOGIC ID PAL 90° NTSC 180°
NTSC/PAL M·DE DET
V-I TRANS
PB MAIN CONV
REC
PB
ACC DET
ACC VCA
PB BURST DEEMPHA AEC BURST EMPHASIS
BURST GATE PULSE GEN
BGP
HD
160 fH VCO
REC PB
REC APC
PB APC
PB H SYNC 1/8 DIVIDER
PB DISCRI D → A (2)
COLOR DET
HALF H SYNC KILLER
PB KILLER AMP
REC PB DET
REC APC AMP
Q213
FILTER
SWD 5V
C217
AMP
EE 5V
FILTER
V SYNC
FILTER
FILTER
C219, C220 R231
C221, C222 R233, R234
BPF
EE
REC
2H DL
AMP

4.4 POWER SYSTEM BLOCK DIAGRAM

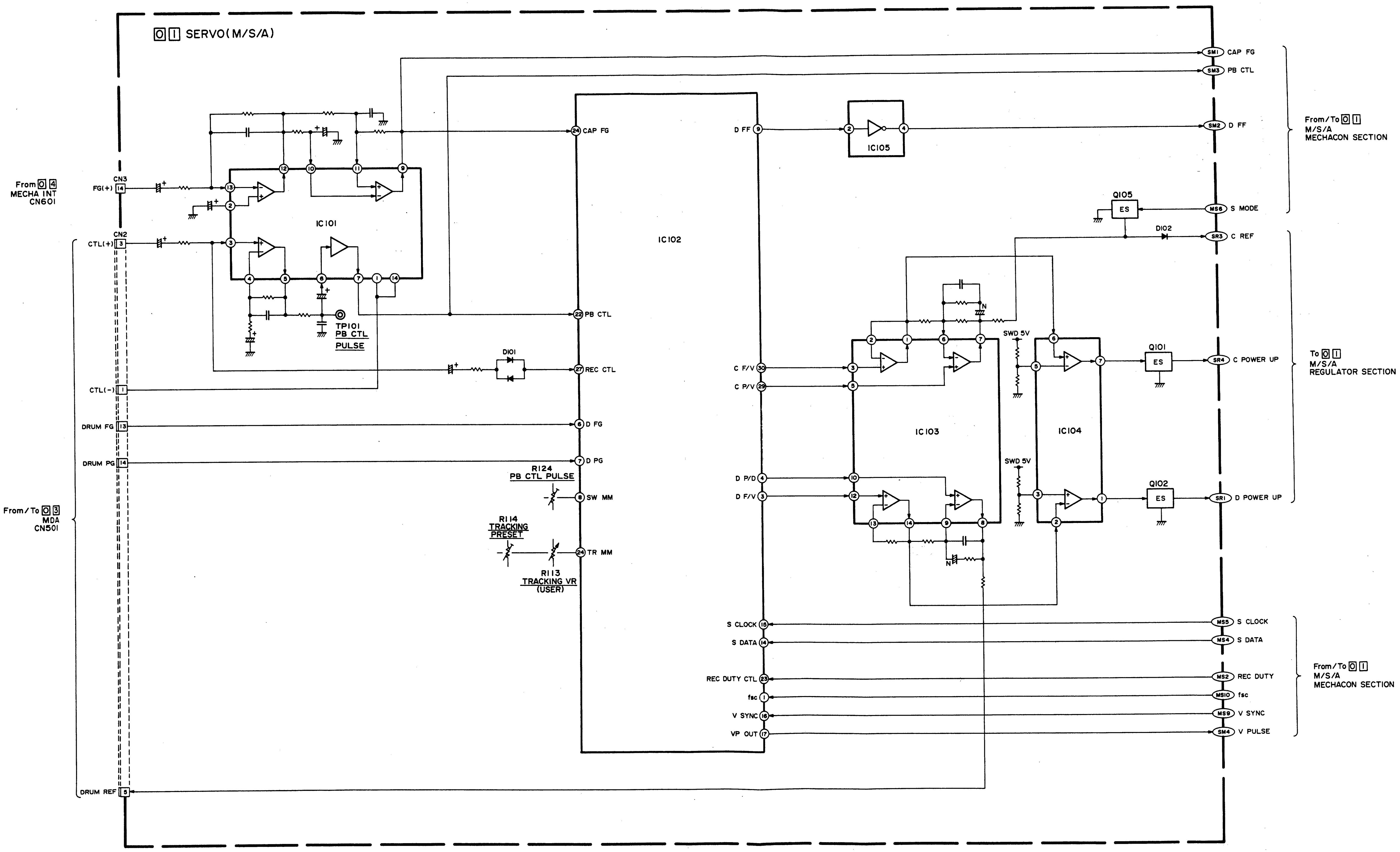


07 TRIGER
BATTERY TERMINAL DC 9.6V
BATTERY(+)
BATTERY(−)
CN6
F1 AC125V 4A
CN10
9.6V
C POWER CTL
CN7
GND
DC JACK
9.6V
R1
CN9
9.6V
AC ADAPT
TRIGGER SW
CN1
27 CAMERA CTL
CN3
AC ADAPT
C POWER CTL
9.6V
9.6V
REG 8V
CN4
01 M/S/A (REGULATOR SECTION)
(MECHACON SECTION)
CN4
C11
IC1
5V REG
D3
CP1
Q3
ES
CP2
CP3
DD1 DC-DC CONVERTER
9.6V
SWD 5V
POWER ON
9.6V
M CTL
C POWER UP
D POWER
D POWER UP
R4 BATTERY ALARM
Q6
ES
Q2
ES
R1
R2
D2
IC2,Q4,Q5
8V REG
CP4
R7 REG 8V ADJ
AC ADAPT
From IC301-36
C POWER CTL
Q306
ES
BAT ARM
To IC301-44
UNSW 5V
RM4
MR1
POWER CTL
From, Q304-C
RM2
SWD 9.6V
BAT CHK
To IC301-32
RM1
REG 8V
RM3
SWD 5V
RM5
(AUDIO SECTION)
REG 8V
RA1
RA2
SWD 9.6V
RA3
(SERVO SECTION)
Q101
ES
From IC104-7
SR4
Q102
ES
From IC104-1
SR1
SWD 5V
RS2
RS3
RS5
CN1
CN6
CN8
CN9
CN3
CN2
03 MDA
CN501
SWD 5V
CN504
DRUM POWER
OPERATION UNIT
CN1
UNSW 5V
SWD 5V
CN2
REG 8V
04 MECHA INT
SWD 5V
CN601
CN607
CN603
CASS LED
CN608
CAP MOTOR
M CTL
SWD 5V
M
17 MODE SENSOR
SWD 5V
23 ENCODER
CN306
CP301
CN303
UNREG 9.6V
C POWER CTL
UNSW −8V
UNSW 15V
UNSW 20V
UNSW 9V
UNSW 5V
UNREG 9V
CP302
UNSW 5V
CN301
CN302
DC-DC CONVERTER
UNREG 9.6V
C POWER CTL
UNSW −8V
UNSW 15V
UNSW 20V
UNSW 9V
UNSW 5V
UNREG 9V
09 START SENSOR
SWD 5V
22 VIDEO-2
UNSW 5V
UNSW 9V
CN206
CN106
21 VIDEO-1
UNSW 9V
UNSW 5V
UNSW 5V(VR)
CN102
CN101
UNSW −8V
UNSW 15V
CN103
CN403
24 IND
UNSW 9V
UNSW 5V
CN406
CN408
UNREG 9V
OP BLOCK
ZOOM SW
AF UNIT
CN404
CN501
25 FAW
UNSW 5V
05 MIC 2
CN704
SWD 5V
06 MIC 1
CN703
SWD 5V
CN702
02 VIDEO
CN4
SWD 5V
CN8
REG 8V
CN6
VF CONNECTOR
10 END SENSOR
SWD 5V

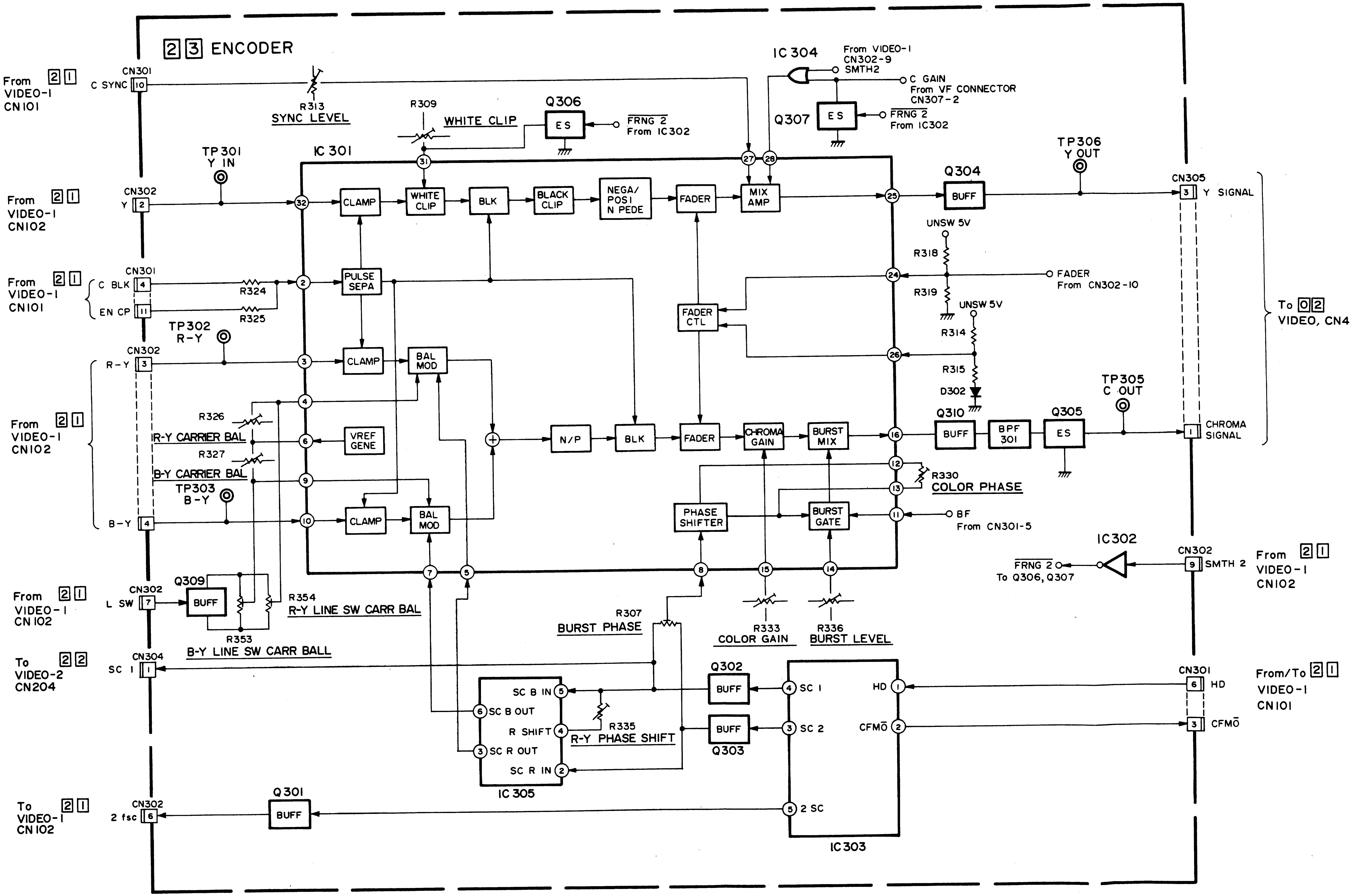
4.5 AUDIO BLOCK DIAGRAM


0 1 AUDIO(M/S/A)
BIAS ON
MA3
EXT
MA5
FROM OPERATION UNIT
CN8
EXT AUDIO
1
FROM 0 6 MIC1,CN702
CN9
MIC AUDIO
2
BGM
MA7
Q206
ES
IC3
EXT
REC
LINE AMP
AGC AGC DET
REC: ON
REC AMP
BIAS
BUF-FER
Q205
AMP
RIPPLE FILTER
PB AMP
REC: ON
REG 8V
MA4
A MUTE
Q203
ES
Q202
ES
AUDIO
AM2
CN10
AUDIO HEAD
R225
AUDIO BIAS LEVEL
L201
AE HEAD
IC201
ES
ES
OSC
Q200,D200
REG 8V
SWD 9.6V
RA3
A REC
MA1
BIAS ON
MA3
18
20
22
23
8
9
14
19
16
1
6
4
7
17
15
5
2
1
3
4
7
10
6
3
1

4.6 SERVO BLOCK DIAGRAM


01 SERVO(M/S/A)
From 04 MECHA INT CN601
CN3
FG(+) 14
CN2
CTL(+) 3
CTL(−) 1
DRUM FG 13
DRUM PG 14
DRUM REF 5
From/To 03 MDA CN501
IC101
TP101 PB CTL PULSE
D101
IC102
CAP FG
PB CTL
REC CTL
D FG
D PG
R124 PB CTL PULSE
SW MM
R114 TRACKING PRESET
TR MM
R113 TRACKING VR (USER)
D FF
C F/V
C P/V
D P/D
D F/V
S CLOCK
S DATA
REC DUTY CTL
fsc
V SYNC
VP OUT
IC105
IC103
IC104
SWD 5V
SWD 5V
Q105
ES
D102
Q101
ES
Q102
ES
SM1 CAP FG
SM3 PB CTL
SM2 D FF
MS6 S MODE
SR3 C REF
From/To 01 M/S/A MECHACON SECTION
SR4 C POWER UP
SR1 D POWER UP
To 01 M/S/A REGULATOR SECTION
MS5 S CLOCK
MS4 S DATA
MS2 REC DUTY
MS10 fsc
MS9 V SYNC
SM4 V PULSE
From/To 01 M/S/A MECHACON SECTION

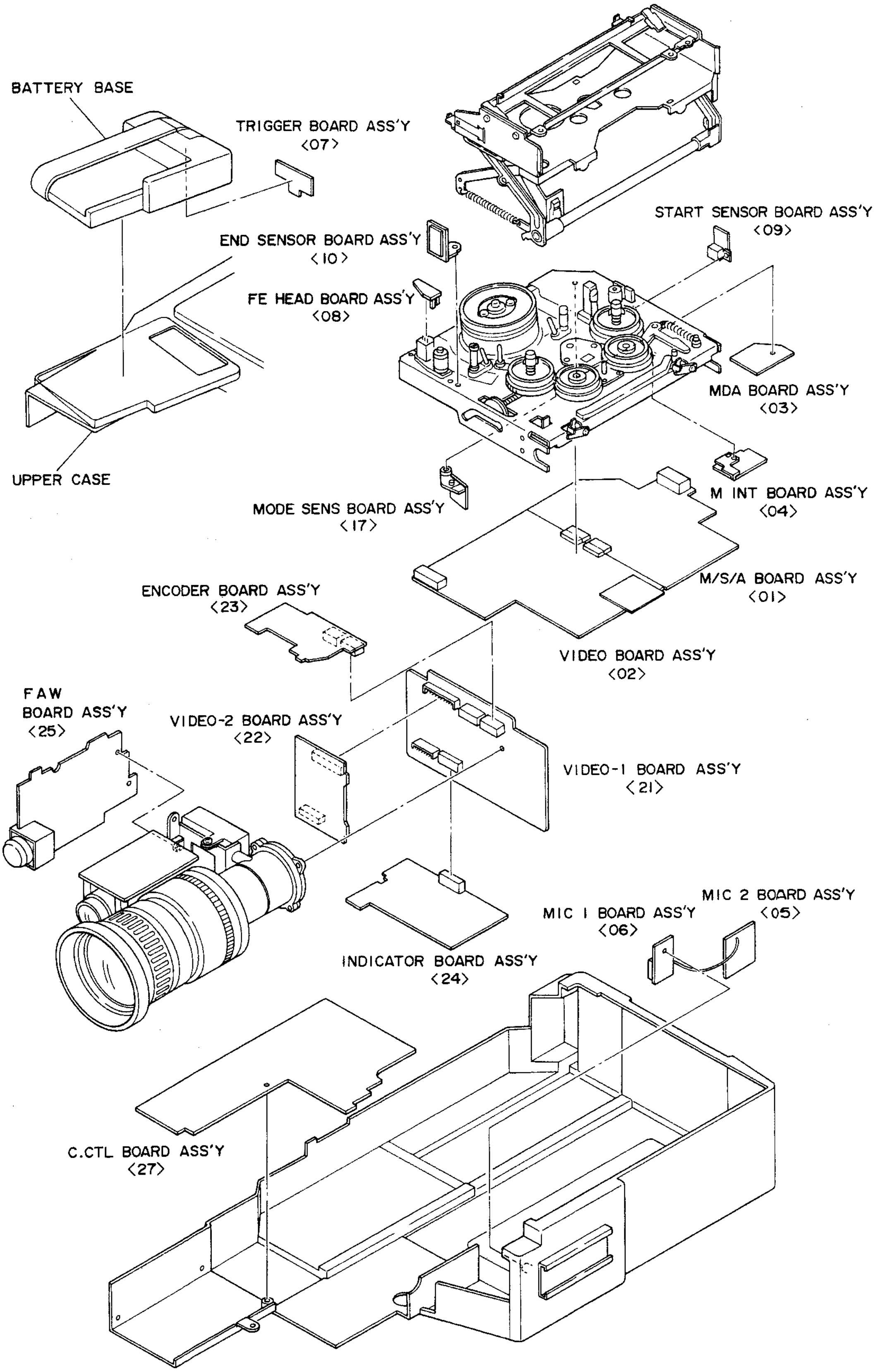
4.7 ENCODER BLOCK DIAGRAM


23 ENCODER
From 21 VIDEO-1 CN101
CN301
C SYNC 10
R313
SYNC LEVEL
R309
WHITE CLIP
Q306
ES
FRNG 2 From IC302
IC 304
From VIDEO-1 CN302-9 SMTH2
C GAIN From VF CONNECTOR CN307-2
Q307
ES
FRNG 2 From IC302
TP306 Y OUT
TP301 Y IN
IC 301
From 21 VIDEO-1 CN102
CN302
Y 2
CLAMP
WHITE CLIP
BLK
BLACK CLIP
NEGA/ POSI N PEDE
FADER
MIX AMP
Q304
BUFF
CN305
3 Y SIGNAL
UNSW 5V
R318
From 21 VIDEO-1 CN101
CN301
C BLK 4
EN CP 11
R324
R325
PULSE SEPA
FADER From CN302-10
R319
UNSW 5V
FADER CTL
To 02 VIDEO, CN4
TP302 R-Y
CN302
R-Y 3
CLAMP
BAL MOD
R314
R315
D302
From 21 VIDEO-1 CN102
R326
R-Y CARRIER BAL
R327
B-Y CARRIER BAL
TP303 B-Y
B-Y 4
VREF GENE
CLAMP
BAL MOD
N/P
BLK
FADER
CHROMA GAIN
BURST MIX
Q310
BUFF
BPF 301
Q305
ES
TP305 C OUT
1 CHROMA SIGNAL
R330
COLOR PHASE
PHASE SHIFTER
BURST GATE
BF From CN301-5
IC302
FRNG 2 To Q306, Q307
CN302
9 SMTH 2
From 21 VIDEO-1 CN102
From 21 VIDEO-1 CN 102
CN302
L SW 7
Q309
BUFF
R354
R-Y LINE SW CARR BAL
R353
B-Y LINE SW CARR BALL
R307
BURST PHASE
R333
COLOR GAIN
R336
BURST LEVEL
To 22 VIDEO-2 CN204
CN304
SC 1 1
SC B IN 5
6 SC B OUT
R SHIFT 4
3 SC R OUT
SC R IN 2
IC 305
R335
R-Y PHASE SHIFT
Q302
BUFF
BUFF
Q303
4 SC 1
3 SC 2
5 2 SC
HD 1
CFMO 2
IC303
CN301
6 HD
3 CFMO
From/To 21 VIDEO-1 CN101
To 21 VIDEO-1 CN 102
CN302
2 fsc 6
Q301
BUFF

SECTION 5
SCHEMATIC DIAGRAMS AND CIRCUIT BOARDS

5.1 CIRCUIT BOARD LOCATION

27	CAMERA CTL
25	FULL AUTO WHITE
24	INDICATOR
23	ENCODER
22	VIDEO - 2
21	VIDEO - 1
17	MODE SENSOR
10	END SENSOR
09	START SENSOR
08	FE HEAD
07	TRIGGER
06	MIC 1
05	MIC 2
04	MECHACON INT
03	MDA
02	VIDEO
01	M/S/A


BATTERY BASE
TRIGGER BOARD ASS'Y <07>
START SENSOR BOARD ASS'Y <09>
END SENSOR BOARD ASS'Y <10>
FE HEAD BOARD ASS'Y <08>
MDA BOARD ASS'Y <03>
UPPER CASE
M INT BOARD ASS'Y <04>
MODE SENS BOARD ASS'Y <17>
M/S/A BOARD ASS'Y <01>
ENCODER BOARD ASS'Y <23>
VIDEO BOARD ASS'Y <02>
FAW BOARD ASS'Y <25>
VIDEO-2 BOARD ASS'Y <22>
VIDEO-1 BOARD ASS'Y <21>
MIC 2 BOARD ASS'Y <05>
MIC 1 BOARD ASS'Y <06>
INDICATOR BOARD ASS'Y <24>
C.CTL BOARD ASS'Y <27>

5.2 SCHEMATIC DIAGRAM NOTE

1. ▨ parts are safety related parts. When replacing them, be sure to use the specified parts.

2. Voltage and waveform measurment condition

- **DECK**

Voltage : DC-measured with a digital voltmeter during recoding (SP mode) and play back (SP-mode) with alignment tape. Where voltage differ between recoding and playback, the voltage during playback is shown in parenthese. (used with Y/C separator 868-209)

Waveform :

VIDEO System; Measured with a color bar during recording (SP mode) with alignment tape. (used with Y/C separator 868-209)

AUDIO System; Measured with 1 kHz (−8 dBs) during recoding and with alignment tape (1 kHz) during playback.

- **CAMERA**

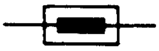
Voltage : Measured with a digital voltmeter in DC range; iris closed. (lens cap on)

Waveform : Measured as the grey scale pattern which lighted up brightly is shot in the Full-Auto mode.

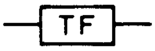
3. Unit indications

No units: [Ω]	No units: [μF]	No units : [μH]
K: [kΩ]	P: [pF]	m: [mH]
M: [MΩ]		

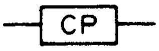
Thermistor



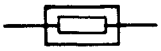
Thermal Fuse

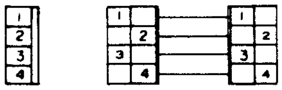


Circuit Protector

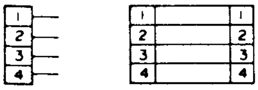


Posistor

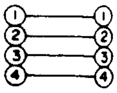




: Connector



: Board in connector

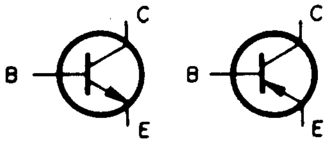


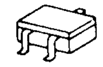
: Direct connection

COUNT UP : Active only at high.
$\overline{\text{COUNT DOWN}}$: Active only at low.

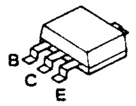
VS : Connected pattern in the board.
MS Abbreviations
V : Video M : Mechacon
SM S : Servo A : Audio
VS : Signal flow from video to servo.

4. Chip transistor



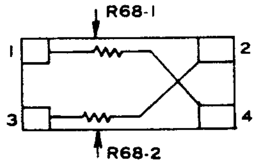


(Standard type)



5. Double chip resistors

These devices contain two resistance elements of differing values. In the example shown in the figure, R68 is comprised of R68-1 between terminals 1 and 4, and R68-2 between terminals 2 and 3.

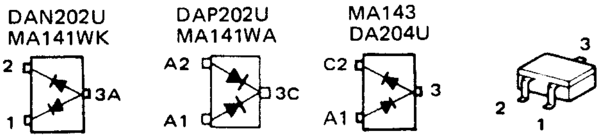


R68 PU59735-472Y103

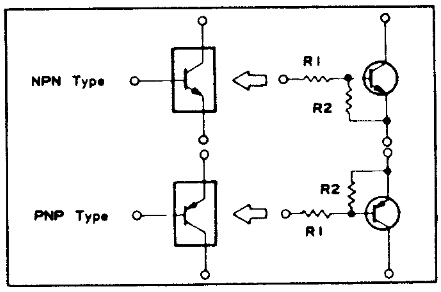
472 indicates 4.7 kΩ for R68-1
103 indicates 10 kΩ for R68-2

As can be noted from the figure, left-right reversal of the device does not change the connection values. However, turning the device upside-down will result in incorrect connectin.

6. Chip diode



7. Digital transistor



RESISTOR VALUES

JUNCTION	Part No.	R1 (kΩ)	R2 (kΩ)
PNP	DTA124EU	22	22
NPN	DTC144EU DTC124EU	47 22	47 22

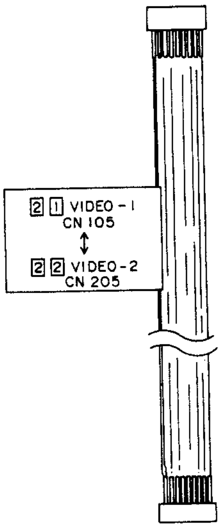
Note: The digital transistor includes built in resistors.
It features small size and high reliability.
Both PNP and NPN types are available.

USES: INVERTER, INTERFACE, DRIVER CIRCUITS.

8. Definition of the surface and the back of circuit board diagrams
   Front : Side on which discrete parts are assembled
   Rear : Side on which chip parts are assembled

9. Patchcords
   Patchcords are available for blue shaded portions of the overall circuit diagram.
   The patchcords are provided with tags to indicate connection points. Connect as indicated.

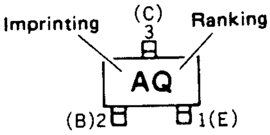
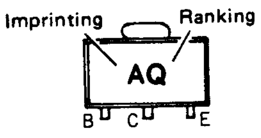
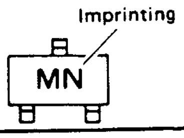
   Example: As shown in the Figure, connect one side to VIDEO-1 board CN105 and the other to



5.3 CHIP TRANSISTOR AND CHIP DIODE IMPRINTING

1. Additional compactness is achieved by using subminiature chip parts for certain circuit elements. When replacing these parts, note the cautions outlined below.

   Chip transistors and diodes used in this model are outlined as follows.

Transistors				Diodes	
Type	Imprinting	Type	Imprinting	Type	Imprinting
DTA124EK	15	2SC2412K(S)	BS	DAN202K	N
DTA143ZK	113	2SC3931(CD)	UC, UD	DAN202U	N
DTC124EK	25	2SC3936(BC)	KB,KC	DAP202K	MN
DTC124TK	05	2SC4098(PQ)	AP, AQ	DA204K	K
DTC144EK	26	2SC4099	JN, JP	FMN1	N1
DTC144WK	86	2SD1328S,T	IDS, IDT	IMN10	N10
FMC2	C2	2SD1819(RS)	YR, YS	MA141WK	MT
FMU1	U1	2SD602(Q)	WQ	MA141WA	MN
FMW3	W3	2SJ146	4D	MA143	MC
IMH6	H6	2SK198P,Q	10P, 10Q	MA151K	MH
2SA1037K(QR)	BQ, BR	2SK620	3N	MA151WK	MT
2SA1532(BC)	EB, EC			MA704	M1K
2SA1576(QR)	FQ, FR			MA716	M1U
2SA1611(56)	M5, M6			RD7.5M-T1B2	752
2SB1132(QR)	BA			RD8.2MB2	822
2SB1218	AR, AS			RD8.2M-T1B3	823
2SB766(QR)	AQ, AR				
2SC2412K(QR)	BQ, BR				
					

Note ; ( ) refers to Transistor rank.

5.4 KEY TO ABBREVIATIONS

A
AC : Alternating Current
ACC : Automatic Color Control
A/CTL : Audio/Control
ADC : Analog to Digital Converter
ADD : Adder
ADJ : Adjustment
AE : Audio Erase
AEF : Automatic Editing Function
AF : Auto Focus
AFC : Automatic Frequency Control
AFT : Automatic Fine Tuning
AGC : Automatic Gain Control
AH : Audio Head
AL : After Loading, Allways
ALC : Automatic Light Compensation
Automatic Level Control
ALM : Alarm
ALU : Arithmetic Logic Unit
AM : Amplitude Modulation
AMP : Amplifier
ANT : Antenna
APC : Automatic Pedestal Control
Automatic Phase Control
APL : Average Picture Level
A/S/M : Audio/Servo/Mechacon
ASS'Y : Assembly
ATT : Attenuator
AUD : Audio
AUTO : Automatic
AUX : Auxiliary

B
B : **Base, Blue**
BAL : Balance
BATT : Battery
BBD : Bucket Brigade Device
BCD : Binary Coded Decimal
BEG : Beginning
BF : Behind Focus
BFP : Burst Flag Pulse
BPF : Band Pass Filter
BIT : Binary Digit
BLK : Black, Blanking
BLU : Blue
BNC : Bayonet Connector
BOT : Beginning of Tape
BPF : Bandpass Filter
BRK : Brake
BRN : Brown
BRT : Brightness
BT : Band Tuning
BUFF : Buffer
BW or B/W : Black and White

C
C : **Capacitance, Collector, Color, Character**
CA : Camera
CAL : Calibration
CAP : Capstan, Capacitor
CAR : Carrier
CARR : Carrier
CASS : Cassette
CC : Cassette Compartment
CCD : Charge Coupled Device
CCT : Circuit
CdS : Cadmium Sulphide
CD : Count Down
CE : Chip Enable
CF : **Ceramic Filter, Color Frame, Correct Focus**
CH : Channel
CHG : Charge
CHROMA : Chrominance
CLK : Clock
CLR : Clear
CMD : Command
CMOS : Complementary Metal Oxide
Semiconductor
CNT : Count, Counter
COL : Color
COM : Common
COMB : Combination
Comb Filter
COMP : Comparator
Composite
Compensation
CONN : Connector
CONV : Converter
CP : Circuit Protector
Clamp Pulse
CPC : Capstan Phase Control
CPU : Central Processing Unit
CTC : Crosstalk Cancel
CTL : Control

D
D : Drum, Digital, Diode, Drain
DAC : Digital to Analog Converter
dB : Decibel
DC : Direct Current
DD : Direct Drive
DEC : Decoder
DEMOD : Demodulator
DEMUX : Demultiplexer
DET : Detector
DEV : Deviation
DFRS : Drum Free Running Stop
DG : Differential Gain
DIF : Differential
DISCR : Discriminator
DL : Delay Line
DOC : Dropout Compensator
DOD : Drop Out Detector
DP : Differential Phase
DPC : Drum Phase Control
DYAC : Dynamic Aperture Control

E
E : Edit, Emitter
EDP : Electronic Data Processing
E-E : Electric to Electric
EF : Emitter-Follower
EMP : Emphasis
EN : Enable
ENC : Encoder
ENV : Envelope
EOT : End of Tape
EP : Extended Play
EQ : Equalizer
ES : Electronic Switch
ESNS : End Sensor
EXP : Expander
EXT : External

F
F : Farad, Fuse
F ADV : Frame Advance
FDP : Fluorescent Display Panel
FE : Full Erase
FET : Field Effect Transistor
FF : **Fast Forward, Front Focus**
Flipflop
FG : Frequency Generator
FM : Frequency Modulation
FR : Full Recording, Frame, Fusible Resistor
FREQ : Frequency
F-V CONV : Frequency to Voltage Converter
FWD : Forward
FWD S : Forward Search

G
G : Green, Gate, Grid
GEN : Generator
GND : Ground
GRN : Green
GRY : Gray

H
H : High, Henry, Hour
HBF : Horizontal Burst Flag
HD : Horizontal Drive
HPF : Highpass Filter
Hz : Herz

I	IC	: Integrated Circuit
	ID	: Identification (Pulse)
	IF	: Intermediate Frequency
	IFR	: Infrared
	IFT	: Intermediate Frequency Transformer
	IND	: Indicator
	INH	: Inhibit
	INS	: Insert
	INT	: Internal, Interrupt
	INV	: Inverter, Interleave
	I/O	: Input/Output
	IR	: Infrared
L	L	: Low, Left
	LCD	: Liquid Crystal Display
	LED	: Light Emitting Diode
	LIM	: Limiter
	LIN	: Linearity
	LLD	: Low Light Detector
	LOAD	: Loading (Cassette)
	LP	: Long Play
	LPF	: Lowpass Filter
	LSB	: Lower Sideband
M	M	: Motor, Mega
	MAX	: Maximum
	MDA	: Motor Drive Amplifier
	MECHACON	: Mechanism Control
	MIC	: Microphone
	MIN	: Minimum
	MIX	: Mixer, Mixing
	MMV	: Monostable Multivibrator
	MNOS	: Metal Nitride Oxide Semiconductor
	MOD	: Modulation, Modulator
	MODEM	: Modulator-Demodulator
	MON	: Monitor
	MOS	: Metal Oxide Semiconductor
	MPX	: Multiplexer, Multiplex
	MS	: Mode Select
	MUT	: Muting
N	NAND	: Not-And
	NC	: Not Connected, Normally Closed
	NFB	: Negative Feedback
	NLN	: Non-Linear
	NO	: Normally Open
	NOR	: Normal, Not-Or
	NR	: Noise Reduction
O	OP	: Operation
	OPAMP	: Operational Amplifier
	ORG	: Orange
	OSC	: Oscillator
P	PB	: Playback
	PC	: Photocoupler, Pulse Counter
	PCM	: Pulse Code Modulation
	PG	: Pulse Generator
	PGM	: Program
	PI	: Photo Interrupter
	PIC	: Picture Control
	PIF	: Picture Intermediate Frequency
	PLA	: Programmable Logic Array
	PLL	: Phase Locked Loop
	PNK	: Pink
	POS	: Position
	p-p	: Peak-to-Peak
	PR	: Pinch Roller
	PREAMP	: Preamplifier
	PRL	: Preroll
	P/S	: Pause/Still
	PSC	: Pulse Swallowing Control
	PU	: Pickup
	PUT	: Programmable Unijunction Transistor
	PWB	: Printed Wiring Board
	PWM	: Pulse Width Modulation
	PWR	: Power
Q	Q	: Quality Factor
R	R	: Red, Right
	RA	: Resistor Array
	RAM	: Random Access Memory
	REC	: Recording
	REF	: Reference
	REG	: Regulated, Regulator
	REM	: Remote
	REMOCON	: Remote Control (Unit)
	REV	: Reverse
	REV S	: Reverse Search
	REW	: Rewind
	RF	: Radio Frequency
	ROM	: Read Only Memory
	R/P	: Record/Playback
	RPT	: Repeat
	RS FF	: RS Flipflop
	RST	: Reset
	RT	: Rotary Transformer
	RUN	: Running
	RY	: Relay
S	SAW	: Sawtooth, Surface Acoustic Wave
	SC	: Subcarrier, Simulcast
	SCH	: Search
	SEL	: Select, Selector
	SENS	: Sensor
	SEP	: Separator
	SF	: Source Follower
	SFF	: Short Fast Forward
	SIF	: Sound Intermediate Frequency
	SN	: Signal to Noise Ratio
	SOL	: Solenoid
	SOS	: Sound on Sound
	SP	: Standard Play
	SR	: Supply Reel
	SREW	: Short Rewind
	S/S	: Slow/Still
	SSG	: Sync Signal Generator
	SSNS	: Start Sensor
	STD	: Strobe Data, Standard
	SUP	: Supply
	SW	: Switch
	SWD	: Switched
	SYNC	: Synchronization
T	TAL	: Tally
	TBC	: Time Base Corrector
	TC	: Tension Control, Time Code
	TEN	: Tension
	TF	: Thermal Fuse
	TIM	: Timing
	TK	: Tracking
	TNR	: Tuner
	TP	: Test Point
	TPZD	: Trapezoid
	TR	: Transistor, Trimmer
	TRANS	: Transformer
	TU	: Take-up
U	UL	: Unloading
	UNREG	: Unregulated
	UNSW	: Unswitched
V	V	: Vertical, Volt
	VACT	: Video Action
	VCO	: Voltage Controlled Oscillator
	VD	: Vertical Drive
	VIF	: Video Intermediate Frequency
	VLT	: Violet
	VR	: Variable Resistor
	VS	: Video and Sync
	VSCH	: Variable Search
	VV	: Video to Video
	VXO	: Variable Crystal Oscillator
W	W	: Watt
	WARN	: Warning
	W & D	: White and Dark
	WHT	: White
	WV	: Working Voltage
X	XTAL	: Crystal
Y	Y	: Luminance
	YEL	: Yellow

5.5 SEMICONDUCTOR SHAPES

	NAME	L
	IC	
A	AFZ74A001X1	7A
	AFZ74A002X1	7A
	AN2275S	5D
	AN3592S	7E
	AN6308S	1A
	AN8009	6E
B	BA10324F	1B
	BA6405F	1B
	BA6452F	7C
	BA7131F	6B
	BA7728F	1A
	BA7600K	4A
	BA7751ALS	6B
	BU3778S	8A
	BU4011BF	1B
	BU4053BF	1B
	BX7469	1C
	BA728F	8E
C	CP1088G	1D
H	HD6305Z0F-CV15	3B
	H8D1927A	5E
	H8D7051A	8D
	GP2L09BC	3C
I	IR3702N1	1B
M	MC8089A	3D
	MC8180B	1E
	MC8181D	1E
	MSM6830	6A
	MSM6831	6A
	MSM6984MS	1A
	MSM6985MS	1A
	M5236ML	3A
	M5282FP	1A
	M54543ASL-A	5B
	M54641FP	2E
N	NJM2904E	1A
P	PU22423A	2C
S	S-81250AG	2A
	S8054HN	4B
T	TC4S69F	6D
	TC4S71F	6D
	THE175A	4D
	THE191A	5C
	THE225A	4D
	TME234	6C

	NAME	L
U	UPC2370GH	2D
	UPC2371GH	2D
	UPC324G2	1B
	UPD4538BG	8B
V	VC2031MP	7B
	VC2038	4E
	VC2039	7D
	VC2041	7C
	VC2043	7D
	VC2044	7D
	VC5026G	6A
	6VT07	3E
	6VT08	3E
	7VT12	8C
	10VT30	4C
	TRANSISTOR	
D	DTA124EK	1F
	DTA143ES	7G
	DTA143ZK	1F
	DTC124EF	7F
	DTC124EK	1F
	DTC124TK	1F
	DTC144EK	1F
	DTC144ES	7F
	DTC144WK	1F
F	FMC2	5F
	FMG1	6F
	FMG2	6F
	FMU1	3G
	FMW3	2G
I	IMH6	5G
2SA	2SA1037K	1F
	2SA1532	1F
	2SA1576	1F
	2SA1610	1F
	2SA1611	1F
	2SA881R	7F
2SB	2SB1132	1G
	2SB1218	1F
	2SB624	1F
	2SB766	1G
	2SB956	1G
2SC	2SC2412K	1F
	2SC3931	1F
	2SC3936	1F
	2SC4081	1F
	2SC4098	1F
	2SC4099	1F
	2SC4176	1F
	2SC4177	1F
	2SC4178	1F

	NAME	L
2SD	2SD1328	1F
	2SD1330	7F
	2SD1819	1F
	2SD602	1F
	2SD772	6G
	2SD814	1G
2SJ	2SJ146	2F
2SK	2SK198	3F
	2SK620	2F
3SK	3SK179	4F
	DIODE	
D	DAN202K	6H
	DAN202U	1H
	DAP209S	6I
	DA204K	6H
	DAP202K	2H
E	ERA81-004	4H
F	FMN1	2I
I	IMN10	3I
M	MA141K	5I
	MA141WA	2H
	MA141WK	1H
	MA143	6H
	MA151K	1I
	MA151WK	1H
	MA184	5H
	MA185	5H
	MA704	5H
	MA716	7H
O	OA90	5H
R	RD5.6EB2	4I
	RD7.5M	1I
	RD7.5MB3	1I
	RD8.2M	1I
	RD8.2EB2	4I
	RD8.2EB	4I
	RD8.2MB2	1I
	RD8.2EBS	4I
	RD20EB2	4I
S	SLN-210VC74	7I
	1SS133	5H

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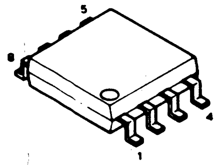
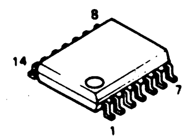
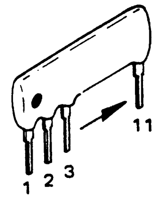
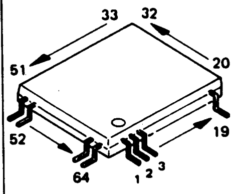
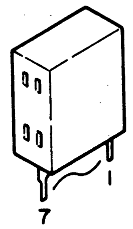
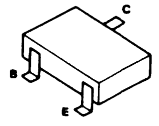
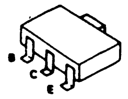
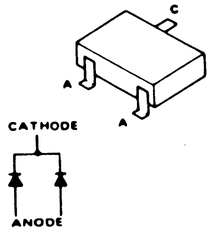
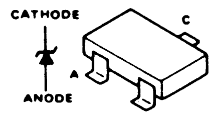
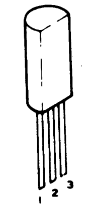
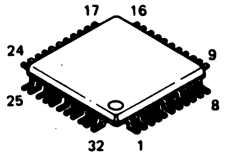
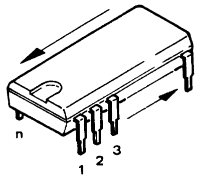
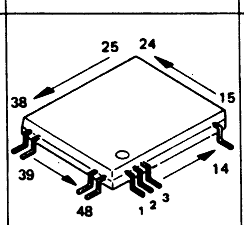
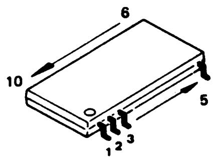
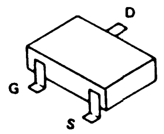
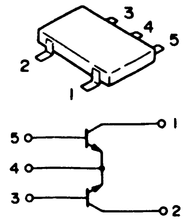
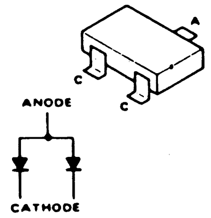
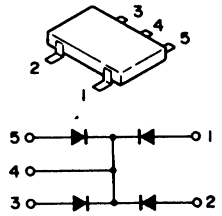
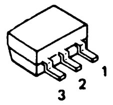
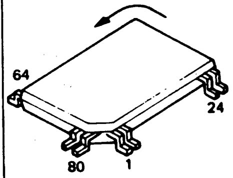
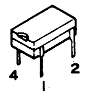
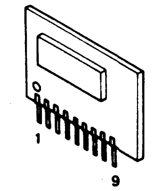
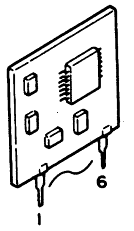
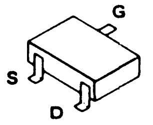
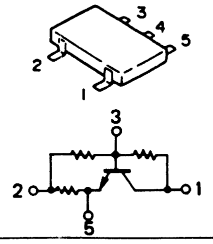
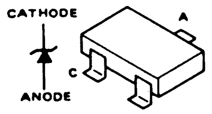
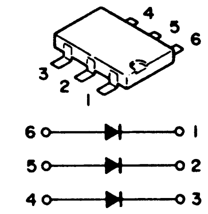
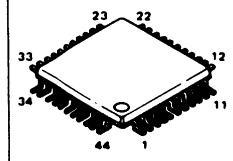
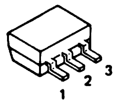
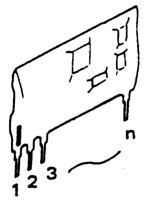
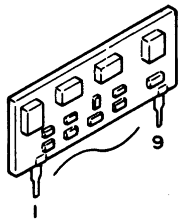
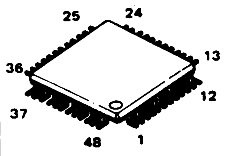
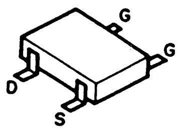
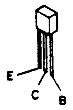
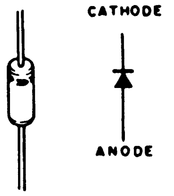
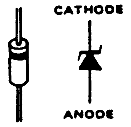
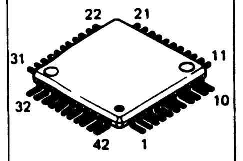
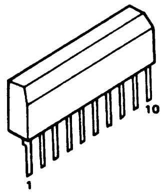
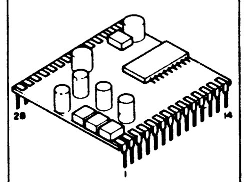
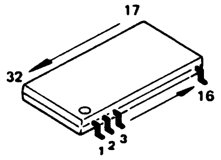
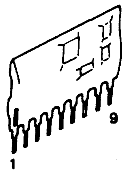
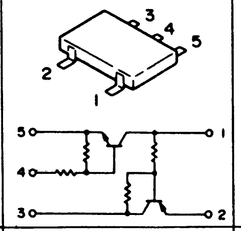
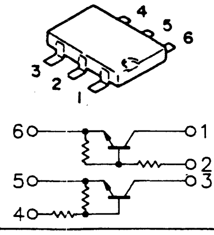
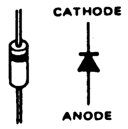
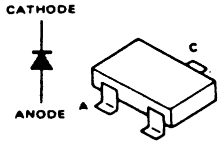
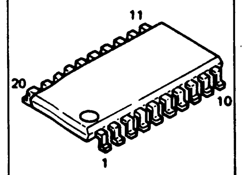
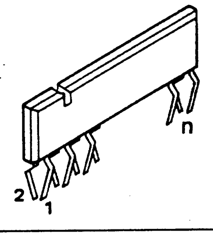
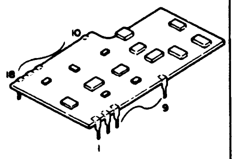
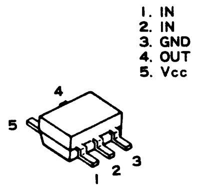
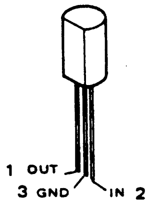
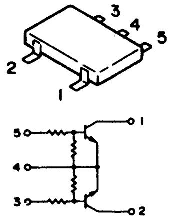
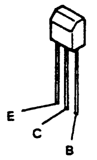
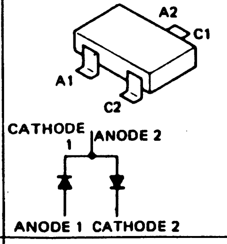
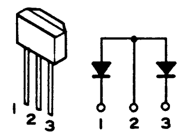
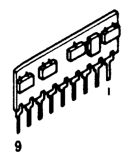
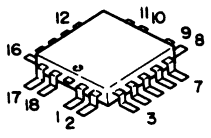
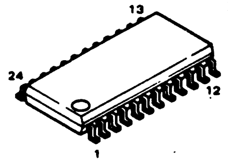
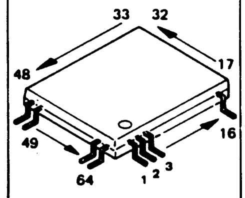
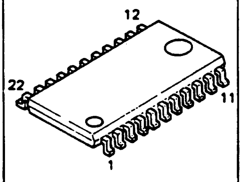
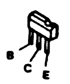
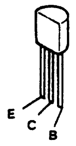
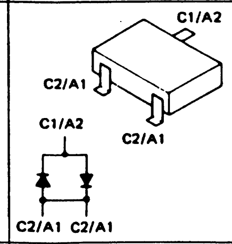
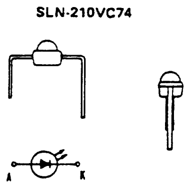
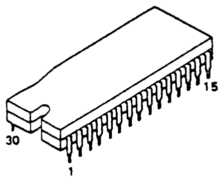
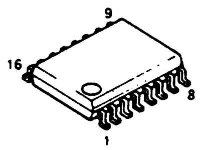
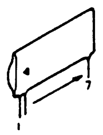
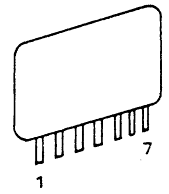
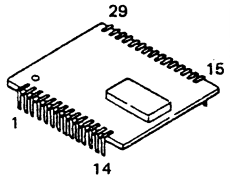
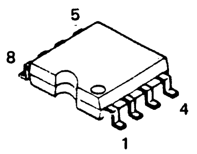
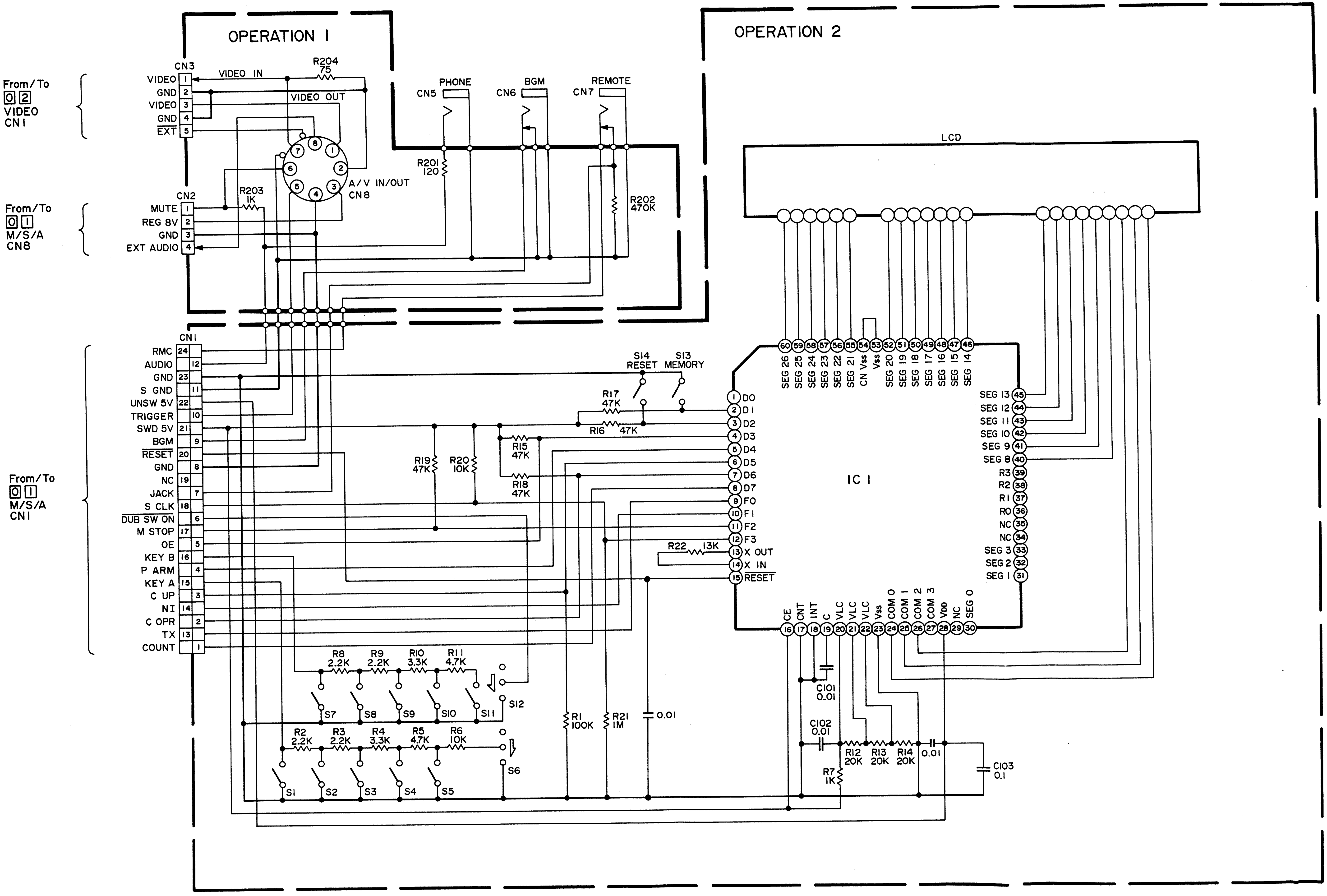
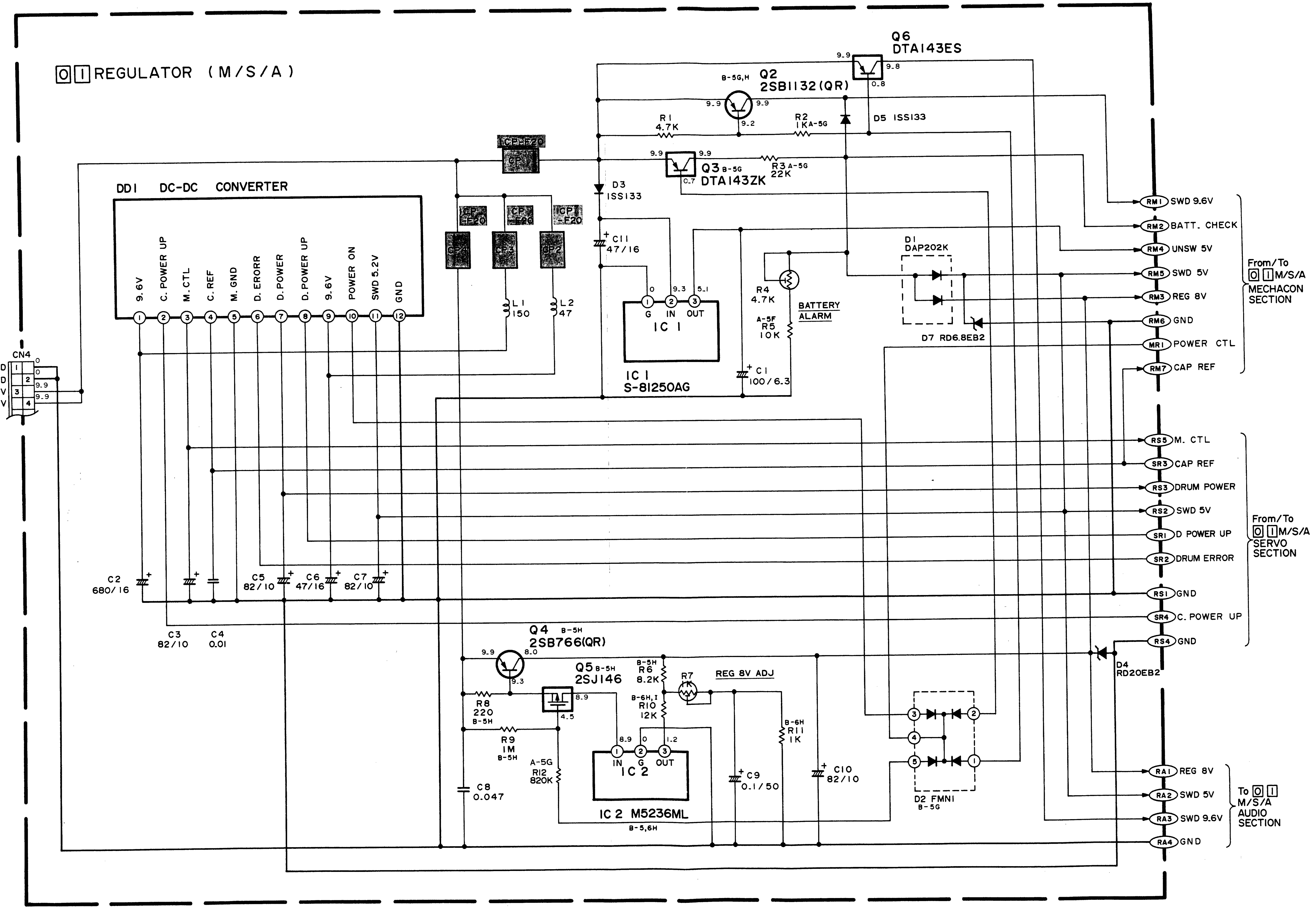
1				 33 32 51 20 52 19 64 1 2 3				 C A A CATHODE ANODE	 CATHODE C A ANODE
2		 17 16 24 9 25 8 32 1		 25 24 38 15 39 14 48 1 2 3			 3 4 5 2 1 5 1 4 3 2	 A C C ANODE CATHODE	 3 4 5 2 1 5 1 4 3 2
3								 CATHODE ANODE A C	 4 5 6 3 2 1 6 1 5 2 4 3
4	 23 22 33 12 34 11 44 1				 25 24 36 13 37 12 48 1			 CATHODE ANODE	 CATHODE ANODE
5	 22 21 31 11 32 10 42 1					 3 4 5 2 1 5 1 4 3 2	 4 5 6 3 2 1 6 1 2 5 3 4	 CATHODE ANODE	 CATHODE ANODE A C
6				 1. IN 2. IN 3. GND 4. OUT 5. Vcc 4 5 1 2 3	 1 OUT 3 GND IN 2	 3 4 5 2 1 5 1 4 3 2		 A2 C1 A1 C2 CATHODE 1 ANODE 2 ANODE 1 CATHODE 2	
7		 12 11 10 9 8 16 7 17 18 1 2 3		 33 32 48 17 49 16 64 1 2 3				 C1/A2 C2/A1 C1/A2 C2/A1 C2/A1 C2/A1	 SLN-210VC74 A K
8									

5-6

5.6 OPERATION SCHEMATIC DIAGRAM

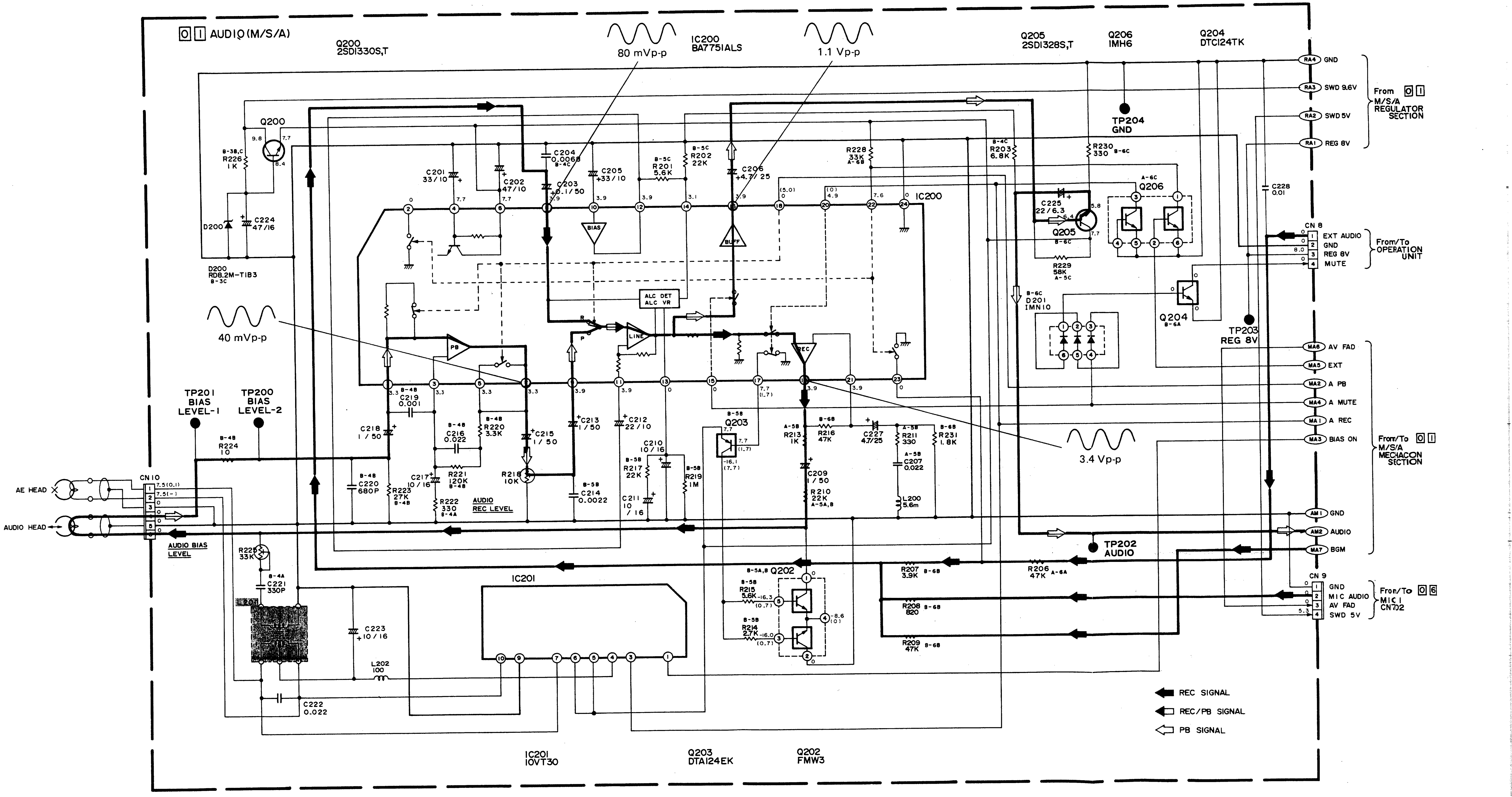

OPERATION 1
OPERATION 2
From/To
02
VIDEO
CN1
CN3
VIDEO 1
GND 2
VIDEO 3
GND 4
EXT 5
VIDEO IN
VIDEO OUT
R204
75
A/V IN/OUT
CN8
From/To
01
M/S/A
CN8
CN2
MUTE 1
REG 8V 2
GND 3
EXT AUDIO 4
R203
1K
PHONE
CN5
BGM
CN6
REMOTE
CN7
R201
120
R202
470K
LCD
From/To
01
M/S/A
CN1
CN1
RMC 24
AUDIO 12
GND 23
S GND 11
UNSW 5V 22
TRIGGER 10
SWD 5V 21
BGM 9
RESET 20
GND 8
NC 19
JACK 7
S CLK 18
DUB SW ON 6
M STOP 17
OE 5
KEY B 16
P ARM 4
KEY A 15
C UP 3
NI 14
C OPR 2
TX 13
COUNT 1
S14
RESET
S13
MEMORY
R17
47K
R16 47K
R15
47K
R18
47K
R19
47K
R20
10K
R22 13K
IC 1
1 D0
2 D1
3 D2
4 D3
5 D4
6 D5
7 D6
8 D7
9 F0
10 F1
11 F2
12 F3
13 X OUT
14 X IN
15 RESET
16 CE
17 CNT
18 INT
19 C
20 VLC
21 VLC
22 VLC
23 Vss
24 COM 0
25 COM 1
26 COM 2
27 COM 3
28 VDD
29 NC
30 SEG 0
31 SEG 1
32 SEG 2
33 SEG 3
34 NC
35 NC
36 R0
37 R1
38 R2
39 R3
40 SEG 8
41 SEG 9
42 SEG 10
43 SEG 11
44 SEG 12
45 SEG 13
46 SEG 14
47 SEG 15
48 SEG 16
49 SEG 17
50 SEG 18
51 SEG 19
52 SEG 20
53 Vss
54 CN Vss
55 SEG 21
56 SEG 22
57 SEG 23
58 SEG 24
59 SEG 25
60 SEG 26
R8
2.2K
R9
2.2K
R10
3.3K
R11
4.7K
S7
S8
S9
S10
S11
S12
R2
2.2K
R3
2.2K
R4
3.3K
R5
4.7K
R6
10K
S1
S2
S3
S4
S5
S6
R1
100K
R21
1M
0.01
C101
0.01
C102
0.01
R12
20K
R13
20K
R14
20K
0.01
R7
1K
C103
0.1

5.7 REGULATOR SCHEMATIC DIAGRAM

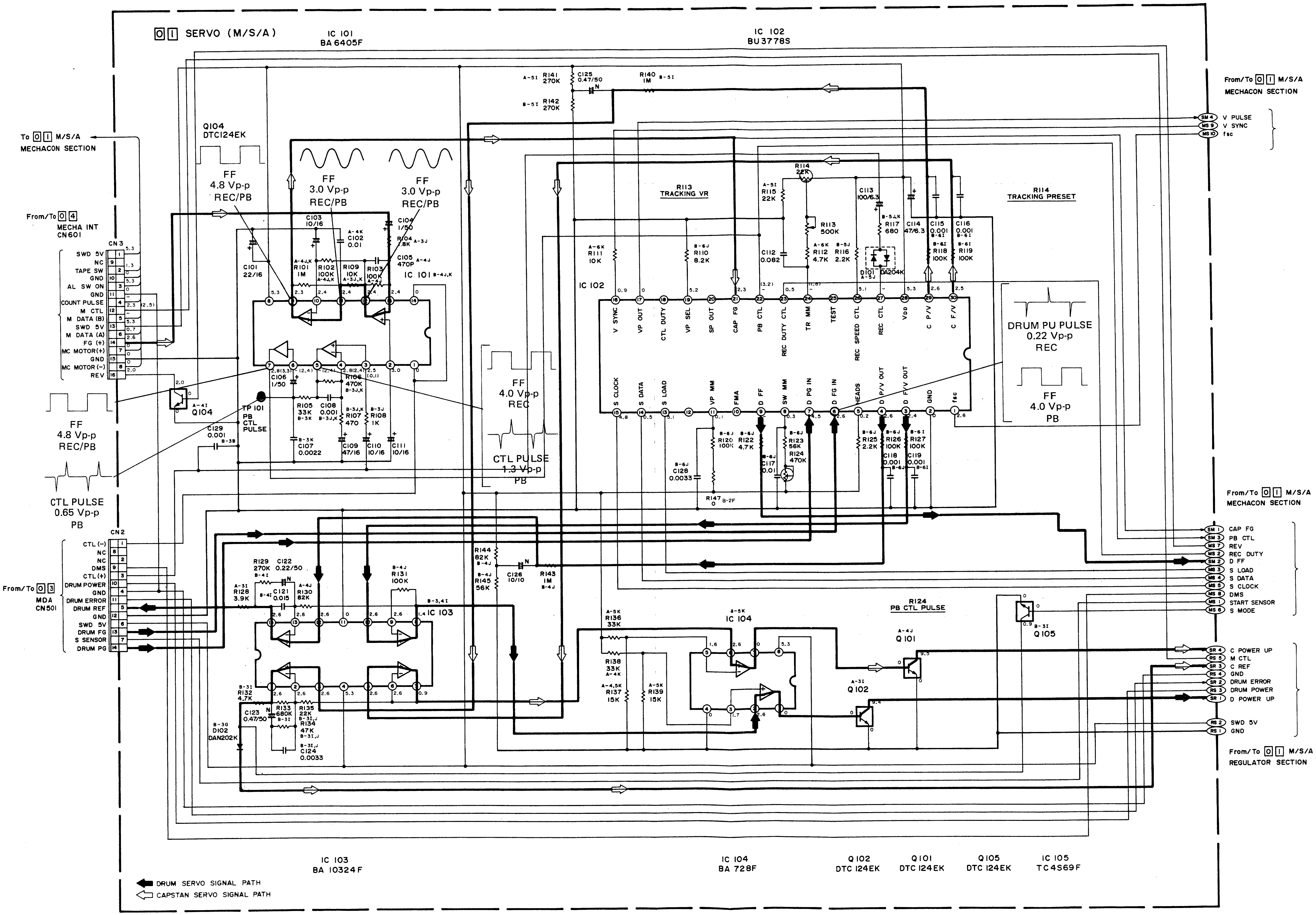


01 REGULATOR (M/S/A)
DD1 DC-DC CONVERTER
9.6V
C. POWER UP
M. CTL
C. REF
M. GND
D. ERORR
D. POWER
D. POWER UP
9.6V
POWER ON
SWD 5.2V
GND
From 27 CAMERA CTL CN3
CN4
GND
GND
9.6V
9.6V
CP-F20
CP1
CP4
CP3
CP2
L1 150
L2 47
Q6 DTA143ES
Q2 2SB1132(QR)
R1 4.7K
R2 1K
D5 1SS133
Q3 DTA143ZK
R3 22K
D3 1SS133
C11 47/16
IC1 S-81250AG
G IN OUT
R4 4.7K
R5 10K
BATTERY ALARM
C1 100/6.3
D1 DAP202K
D7 RD6.8EB2
RM1 SWD 9.6V
RM2 BATT. CHECK
RM4 UNSW 5V
RM5 SWD 5V
RM3 REG 8V
RM6 GND
MR1 POWER CTL
RM7 CAP REF
From/To 01 M/S/A MECHACON SECTION
RS5 M. CTL
SR3 CAP REF
RS3 DRUM POWER
RS2 SWD 5V
SR1 D POWER UP
SR2 DRUM ERROR
RS1 GND
SR4 C. POWER UP
RS4 GND
From/To 01 M/S/A SERVO SECTION
C2 680/16
C3 82/10
C4 0.01
C5 82/10
C6 47/16
C7 82/10
Q4 2SB766(QR)
Q5 2SJ146
R6 8.2K
R7 REG 8V ADJ
R8 220
R9 1M
R10 12K
R11 1K
R12 820K
C8 0.047
C9 0.1/50
C10 82/10
IC2 M5236ML
D2 FMN1
D4 RD20EB2
RA1 REG 8V
RA2 SWD 5V
RA3 SWD 9.6V
RA4 GND
To 01 M/S/A AUDIO SECTION

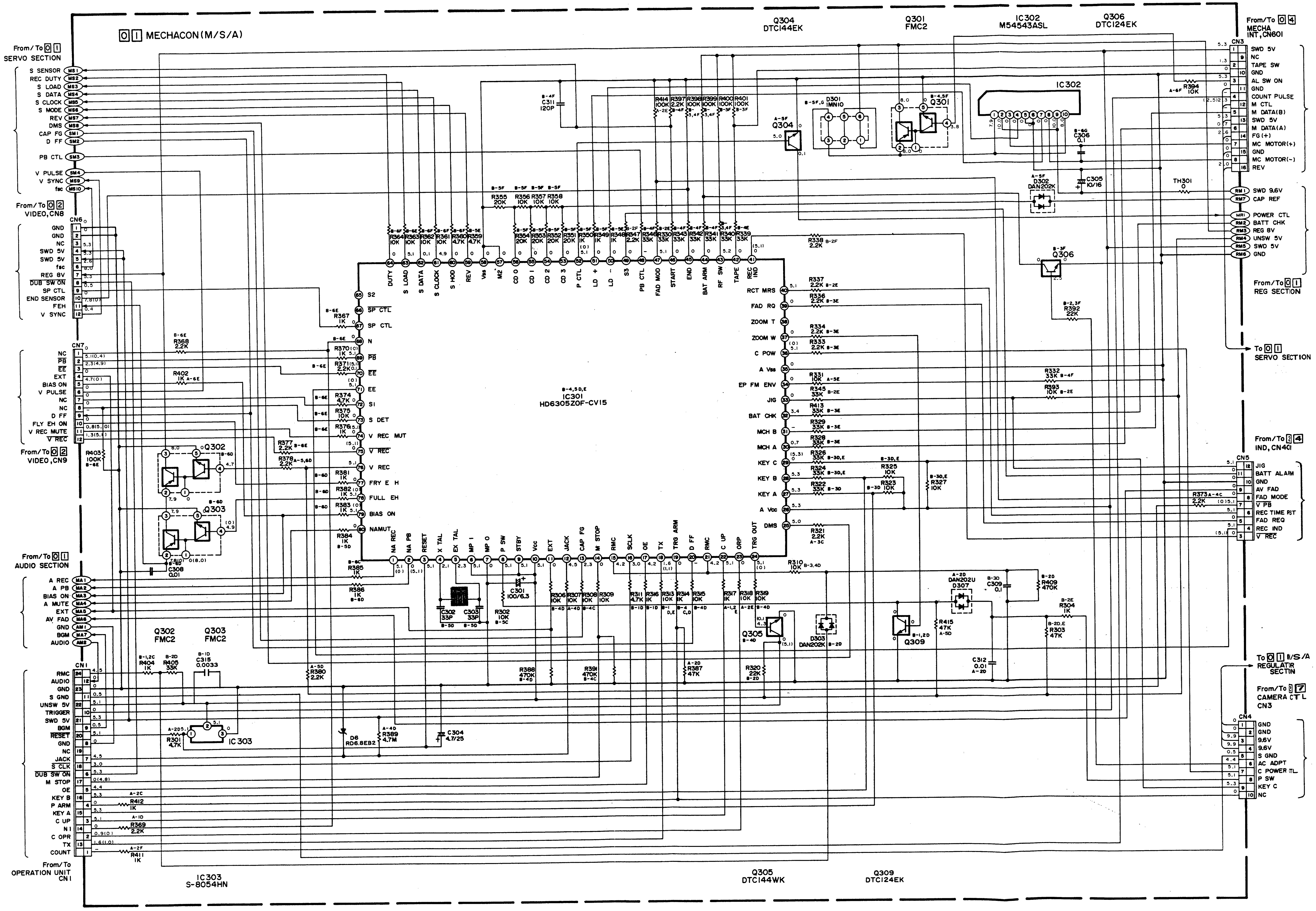
5.8 AUDIO SCHEMATIC DIAGRAM


0 1 AUDIO (M/S/A)
Q200 2SD1330S,T
80 mVp-p
IC200 BA7751ALS
1.1 Vp-p
Q205 2SD1328S,T
Q206 IMH6
Q204 DTC124TK
RA4 GND
RA3 SWD 9.6V
RA2 SWD 5V
RA1 REG 8V
From 0 1 M/S/A REGULATOR SECTION
TP204 GND
Q200
R226 1K
D200
C224 47/16
D200 RD8.2M-T1B3
C201 33/10
C202 47/10
C204 0.0068
C203 0.1/50
C205 33/10
R201 5.6K
R202 22K
C206 4.7/25
R228 33K
R203 6.8K
R230 330
C225 22/6.3
Q205
R229 58K
Q206
C228 0.01
IC200
BIAS
BUFF
ALC DET ALC VR
LINE
PB
REC
D201 IMN10
Q204
TP203 REG 8V
CN 8
EXT AUDIO
GND
REG 8V
MUTE
From/To OPERATION UNIT
MA6 AV FAD
MA5 EXT
MA2 A PB
MA4 A MUTE
MA1 A REC
MA3 BIAS ON
From/To 0 1 M/S/A MECHACON SECTION
40 mVp-p
TP201 BIAS LEVEL-1
TP200 BIAS LEVEL-2
R224 10
C218 1/50
C219 0.001
C216 0.022
R220 3.3K
C215 1/50
C220 680P
R223 27K
C217 10/16
R221 120K
R222 330
AUDIO REC LEVEL
R218 10K
C213 1/50
C214 0.0022
C212 22/10
C210 10/16
R217 22K
R219 1M
C211 10/16
Q203
R213 1K
R216 47K
C227 4.7/25
R211 330
R231 1.8K
C207 0.022
C209 1/50
R210 22K
L200 5.6m
3.4 Vp-p
AE HEAD
AUDIO HEAD
CN10
AUDIO BIAS LEVEL
R225 33K
C221 330P
C223 10/16
L202 100
C222 0.022
IC201
Q202
R215 5.6K
R214 2.7K
TP202 AUDIO
R207 3.9K
R206 47K
R208 820
R209 47K
AM1 GND
AM2 AUDIO
MA7 BGM
CN 9
GND
MIC AUDIO
AV FAD
SWD 5V
From/To 0 6 MIC 1 CN702
REC SIGNAL
REC/PB SIGNAL
PB SIGNAL
IC201 10VT30
Q203 DTA124EK
Q202 FMW3

5.9 SERVO SCHEMATIC DIAGRAM

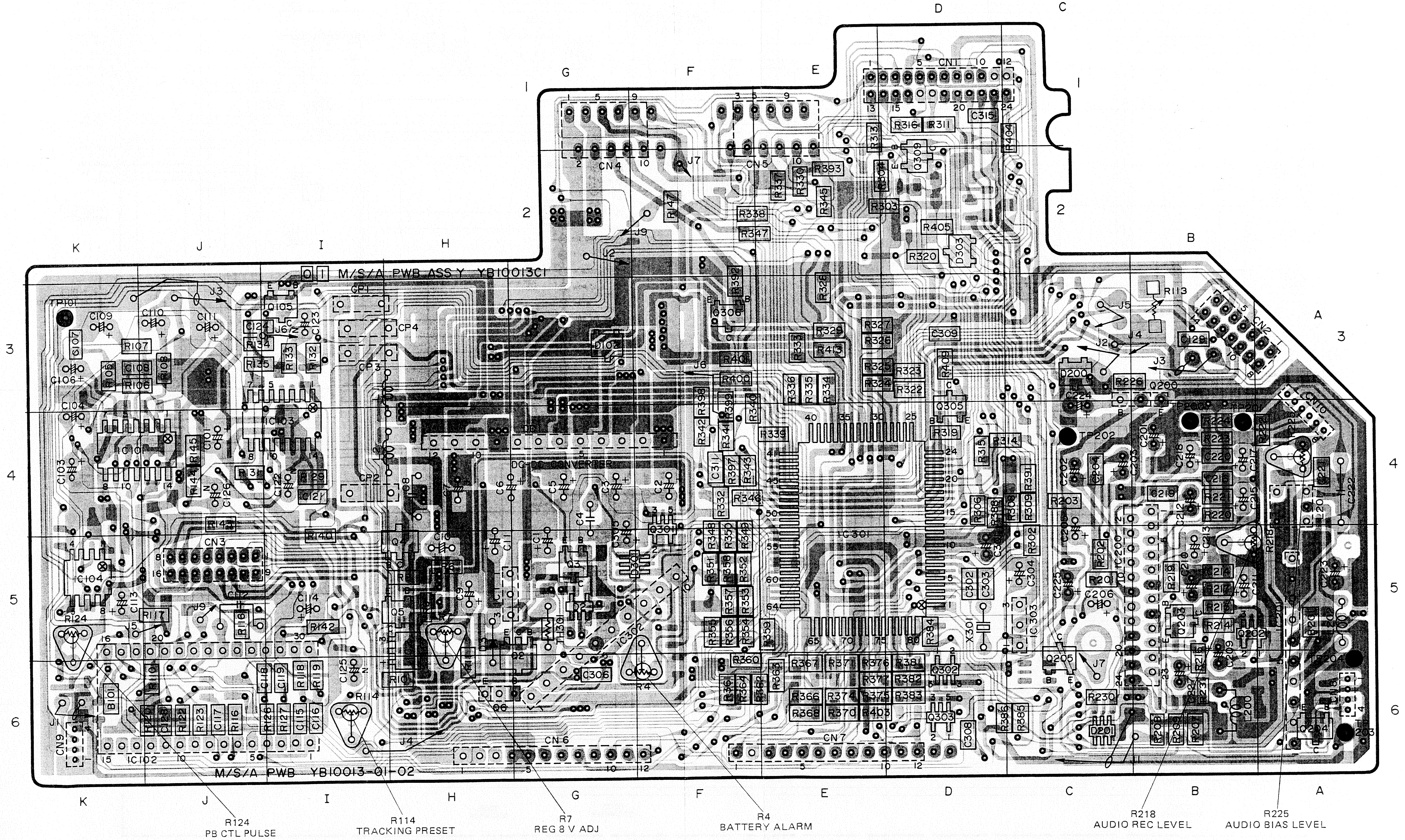

01 SERVO (M/S/A)
IC 101
BA6405F
IC 102
BU3778S
To 01 M/S/A
MECHACON SECTION
Q104
DTC124EK
FF
4.8 Vp-p
REC/PB
FF
3.0 Vp-p
REC/PB
FF
3.0 Vp-p
REC/PB
From/To 04
MECHA INT
CN601
CN3
SWD 5V
NC
TAPE SW
GND
AL SW ON
GND
COUNT PULSE
M CTL
M DATA (B)
SWD 5V
M DATA (A)
FG (+)
MC MOTOR(+)
GND
MC MOTOR(−)
REV
FF
4.8 Vp-p
REC/PB
CTL PULSE
0.65 Vp-p
PB
TP 101
PB
CTL
PULSE
FF
4.0 Vp-p
REC
CTL PULSE
1.3 Vp-p
PB
R113
TRACKING VR
R114
TRACKING PRESET
DRUM PU PULSE
0.22 Vp-p
REC
FF
4.0 Vp-p
PB
IC 102
V SYNC
VP OUT
CTL DUTY
VP SEL
SP OUT
CAP FG
PB CTL
REC DUTY CTL
TR MM
TEST
REC SPEED CTL
REC CTL
VDD
C P/V
C F/V
S CLOCK
S DATA
S LOAD
VP MM
FMA
D FF
SW MM
D PG IN
D FG IN
HEADS
D P/V OUT
D F/V OUT
GND
fsc
From/To 01 M/S/A
MECHACON SECTION
SM4 V PULSE
MS9 V SYNC
MS10 fsc
From/To 01 M/S/A
MECHACON SECTION
SM1 CAP FG
SM3 PB CTL
MS7 REV
MS2 REC DUTY
SM2 D FF
MS3 S LOAD
MS4 S DATA
MS5 S CLOCK
MS8 DMS
MS1 START SENSOR
MS6 S MODE
From/To 03
MDA
CN501
CN2
CTL(−)
NC
NC
DMS
CTL(+)
DRUM POWER
GND
DRUM ERROR
DRUM REF
GND
SWD 5V
DRUM FG
S SENSOR
DRUM PG
IC 103
IC 104
R124
PB CTL PULSE
Q101
Q102
Q105
SR4 C POWER UP
RS5 M CTL
SR3 C REF
RS4 GND
SR2 DRUM ERROR
RS3 DRUM POWER
SR1 D POWER UP
RS2 SWD 5V
RS1 GND
From/To 01 M/S/A
REGULATOR SECTION
IC 103
BA 10324F
IC 104
BA 728F
Q102
DTC 124EK
Q101
DTC 124EK
Q105
DTC 124EK
IC 105
TC4S69F
DRUM SERVO SIGNAL PATH
CAPSTAN SERVO SIGNAL PATH

5.10 MECHACON SCHEMATIC DIAGRAM

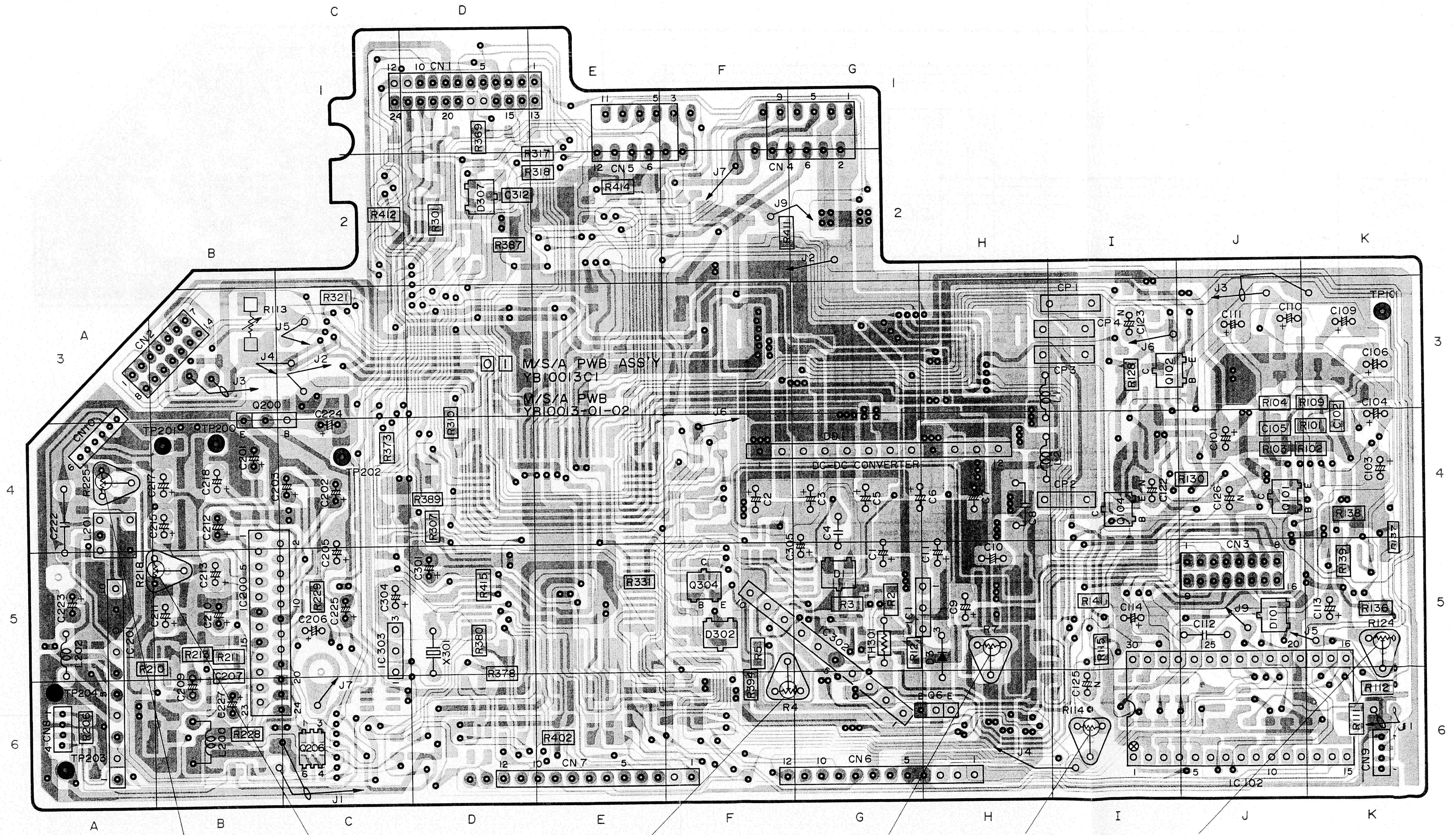

01 MECHACON(M/S/A)
From/To 01 SERVO SECTION
S SENSOR
REC DUTY
S LOAD
S DATA
S CLOCK
S MODE
REV
DMS
CAP FG
D FF
PB CTL
V PULSE
V SYNC
fsc
From/To 02 VIDEO,CN8
CN6
GND
GND
NC
SWD 5V
SWD 5V
fsc
REG 8V
DUB SW ON
SP CTL
END SENSOR
FEH
V SYNC
CN7
NC
PB
EE
EXT
BIAS ON
V PULSE
NC
NC
D FF
FLY EH ON
V REC MUTE
V REC
From/To 02 VIDEO,CN9
From/To 01 AUDIO SECTION
A REC
A PB
BIAS ON
A MUTE
EXT
AV FAD
GND
BGM
AUDIO
CN1
RMC
AUDIO
GND
S GND
UNSW 5V
TRIGGER
SWD 5V
BGM
RESET
GND
NC
JACK
S CLK
DUB SW ON
M STOP
OE
KEY B
P ARM
KEY A
C UP
N I
C OPR
TX
COUNT
From/To OPERATION UNIT CN1
Q302 FMC2
Q303 FMC2
IC303 S-8054HN
IC303
Q304 DTC144EK
Q301 FMC2
IC302 M54543ASL
Q306 DTC124EK
IC301 HD6305Z0F-CV15
D301 IMN10
D302 DAN202K
D303 DAN202K
D307 DAN202U
D6 RD6.8EB2
TH301
Q305 DTC144WK
Q309 DTC124EK
From/To 04 MECHA INT,CN601
CN3
SWD 5V
NC
TAPE SW
GND
AL SW ON
GND
COUNT PULSE
M CTL
M DATA(B)
SWD 5V
M DATA(A)
FG(+)
MC MOTOR(+)
GND
MC MOTOR(-)
REV
SWD 9.6V
CAP REF
POWER CTL
BATT CHK
REG 8V
UNSW 5V
SWD 5V
GND
From/To 01 REG SECTION
To 01 SERVO SECTION
From/To 24 IND,CN401
CN5
JIG
BATT ALARM
GND
AV FAD
FAD MODE
V PB
REC TIME RST
FAD REQ
REC IND
V REC
To 01 M/S/A REGULATOR SECTION
From/To 37 CAMERA CTL CN3
CN4
GND
GND
9.6V
9.6V
S GND
AC ADPT
C POWER CTL
P SW
KEY C
NC
DUTY
S LOAD
S DATA
S CLOCK
S HOD
REV
Vss
M2
CD 0
CD 1
CD 2
CD 3
P CTL
LD +
LD -
S3
PB CTL
FAD MOD
START
END
BAT ARM
RF SW
TAPE
REC IND
S2
SP CTL
SP CTL
N
PB
EE
EE
SI
S DET
V REC MUT
V REC
V REC
FRY E H
FULL EH
BIAS ON
NAMUT
NA REC
NA PB
RESET
X TAL
EX TAL
MP I
MP O
P SW
STBY
Vcc
EXT
JACK
CAP FG
M STOP
RMC
SCLK
OE
TX
TRG ARM
D FF
RMC
C UP
ORP
TRG OUT
RCT MRS
FAD RQ
ZOOM T
ZOOM W
C POW
A Vss
EP FM ENV
JIG
BAT CHK
MCH B
MCH A
KEY C
KEY B
KEY A
A Vcc
DMS
C311 120P
C305 10/16
C306 0.1
C308 0.01
C315 0.0033
C301 100/6.3
C302 33P
C303 33P
C304 4.7/25
C309 0.1
C312 0.01
R394 10K
R355 20K
R356 10K
R357 10K
R358 10K
R414 100K
R397 2.2K
R398 100K
R399 100K
R400 100K
R401 100K
R364 10K
R363 10K
R362 10K
R361 10K
R360 4.7K
R359 4.7K
R354 20K
R353 20K
R352 20K
R351 20K
R350 1K
R349 1K
R348 1K
R347 2.2K
R346 33K
R330 33K
R343 33K
R342 33K
R341 33K
R340 33K
R339 33K
R338 2.2K
R337 2.2K
R336 2.2K
R334 2.2K
R333 2.2K
R331 10K
R345 33K
R413 33K
R329 33K
R328 33K
R326 33K
R324 33K
R322 33K
R321 2.2K
R325 10K
R323 10K
R327 10K
R332 33K
R393 10K
R392 22K
R367 1K
R368 2.2K
R370 1K
R371 2.2K
R402 1K
R374 47K
R375 10K
R376 1K
R377 2.2K
R378 2.2K
R381 1K
R382 1K
R383 1K
R384 1K
R385 1K
R386 1K
R403 100K
R373 2.2K
R310 10K
R409 470K
R304 1K
R303 47K
R415 47K
R306 10K
R307 10K
R308 10K
R309 10K
R311 4.7K
R316 1K
R313 10K
R314 1K
R315 10K
R317 1K
R318 10K
R319 10K
R302 10K
R388 470K
R391 470K
R387 47K
R320 22K
R380 2.2K
R389 4.7M
R404 1K
R405 33K
R301 4.7K
R412 1K
R369 2.2K
R411 1K

5.11 M/S/A CIRCUIT BOARD

– Rear –


M/S/A PWB ASS'Y YB10013C1
M/S/A PWB YB10013-01-02
DC-DC CONVERTER
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN9
CN10
IC102
IC103
IC104
IC200
IC301
IC302
IC303
TP101
TP202
A
B
C
D
E
F
G
H
I
J
K
1
2
3
4
5
6
R124
PB CTL PULSE
R114
TRACKING PRESET
R7
REG 8 V ADJ
R4
BATTERY ALARM
R218
AUDIO REC LEVEL
R225
AUDIO BIAS LEVEL

– Front –


01 M/S/A PWB ASS'Y
YB10013C1
M/S/A PWB
YB10013-01-02
DC-DC CONVERTER
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN9
CN10
IC200-5
IC201
IC303
IC302
IC102
TP101
TP200
TP201
TP202
TP203
TP204
A
B
C
D
E
F
G
H
I
J
K
1
2
3
4
5
6

R225
AUDIO BIAS LEVEL

R218
AUDIO REC LEVEL

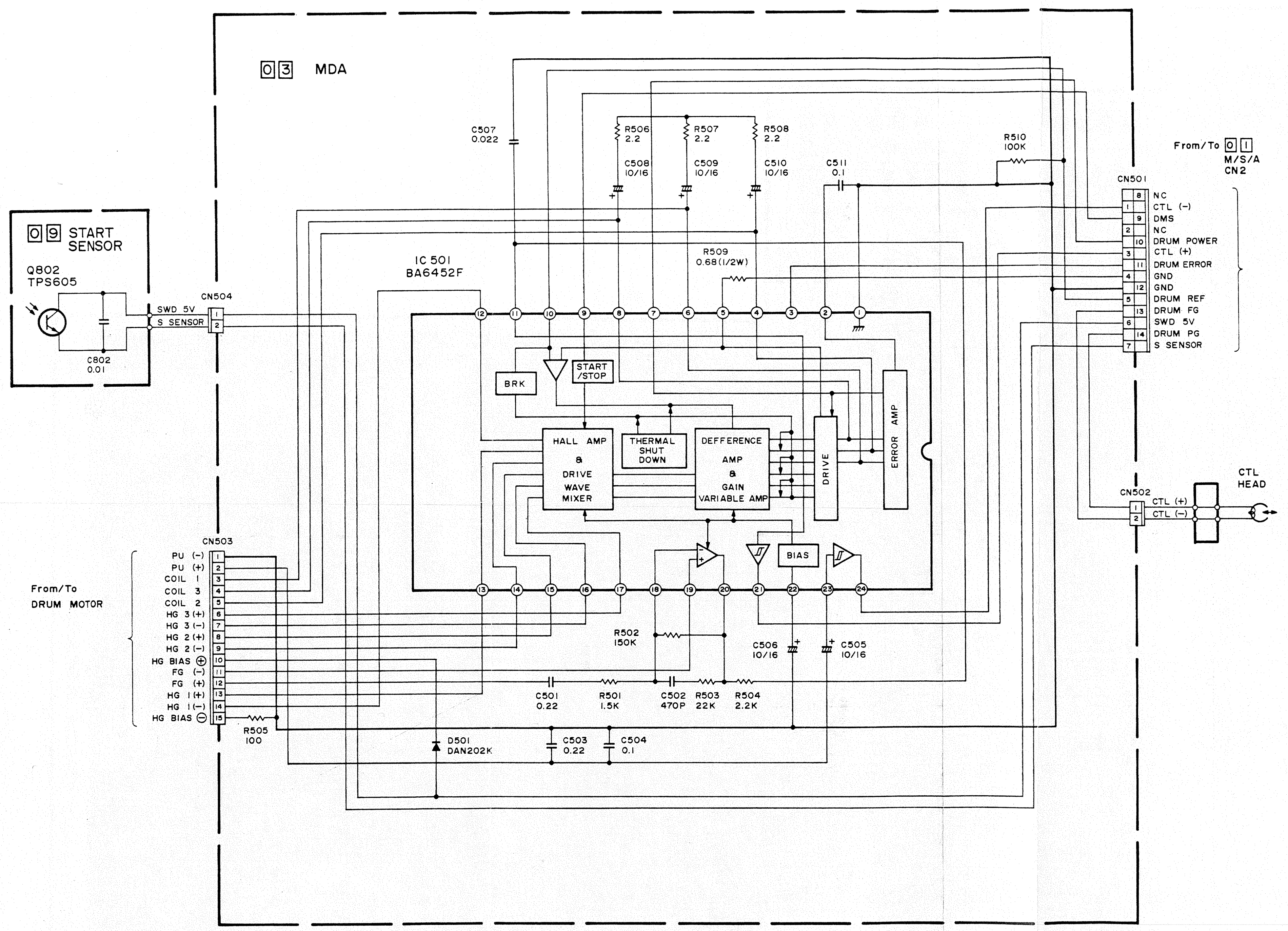
R4
BATTERY ALARM

R7
REG 8 V ADJ

R114
TRACKING PRESET

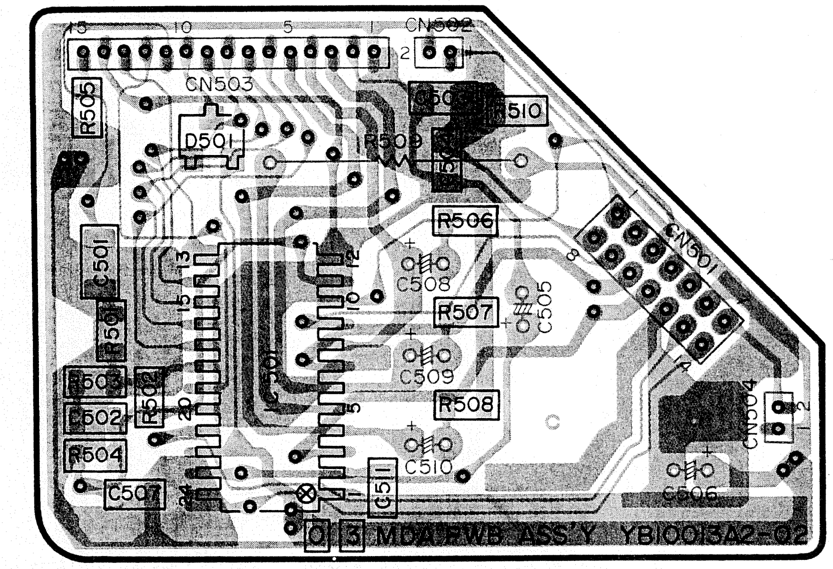
R124
PB CTL PULSE

5.12 MDA SCHEMATIC DIAGRAM



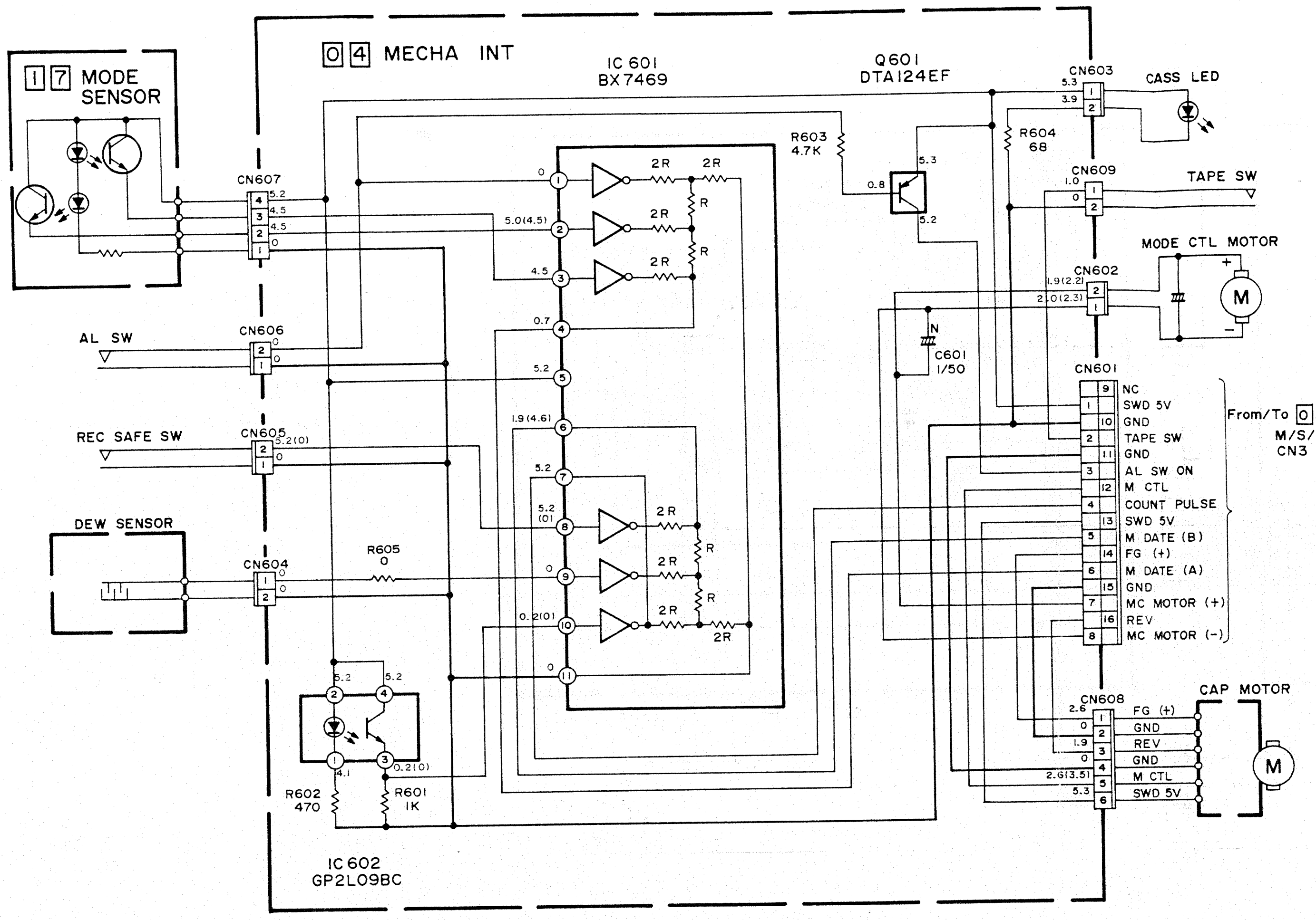
03 MDA
09 START SENSOR
Q802 TPS605
C802 0.01
SWD 5V
S SENSOR
CN504
C507 0.022
R506 2.2
R507 2.2
R508 2.2
C508 10/16
C509 10/16
C510 10/16
C511 0.1
R510 100K
R509 0.68(1/2W)
IC 501 BA6452F
BRK
START /STOP
HALL AMP & DRIVE WAVE MIXER
THERMAL SHUT DOWN
DEFFERENCE AMP & GAIN VARIABLE AMP
DRIVE
ERROR AMP
BIAS
From/To 01 M/S/A CN2
CN501
NC
CTL (−)
DMS
NC
DRUM POWER
CTL (+)
DRUM ERROR
GND
GND
DRUM REF
DRUM FG
SWD 5V
DRUM PG
S SENSOR
CN502
CTL (+)
CTL (−)
CTL HEAD
CN503
From/To DRUM MOTOR
PU (−)
PU (+)
COIL 1
COIL 3
COIL 2
HG 3(+)
HG 3(−)
HG 2(+)
HG 2(−)
HG BIAS ⊕
FG (−)
FG (+)
HG 1(+)
HG 1(−)
HG BIAS ⊖
R505 100
R502 150K
C506 10/16
C505 10/16
C501 0.22
R501 1.5K
C502 470P
R503 22K
R504 2.2K
D501 DAN202K
C503 0.22
C504 0.1

5.13 MDA CIRCUIT BOARD



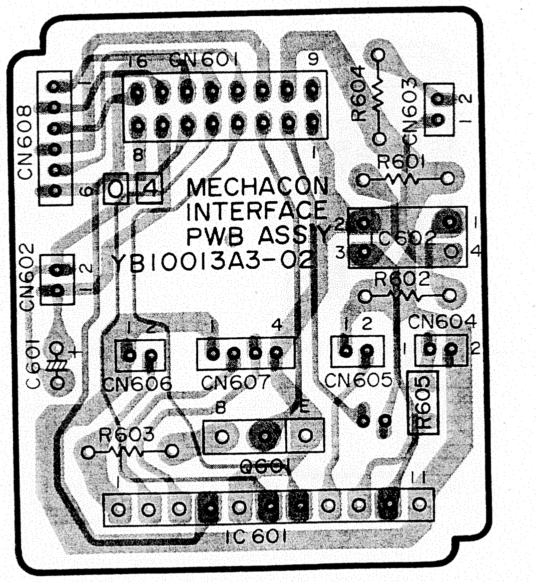
CN502
CN503
CN501
CN504
D501
R505
R509
R510
R506
R507
R508
C501
C502
C503
C504
C505
C506
C507
C508
C509
C510
C511
R501
R502
R503
R504
03 MDA PWB ASS'Y YB10013A2-02

5.14 MECHACON INTERFACE SCHEMATIC DIAGRAM



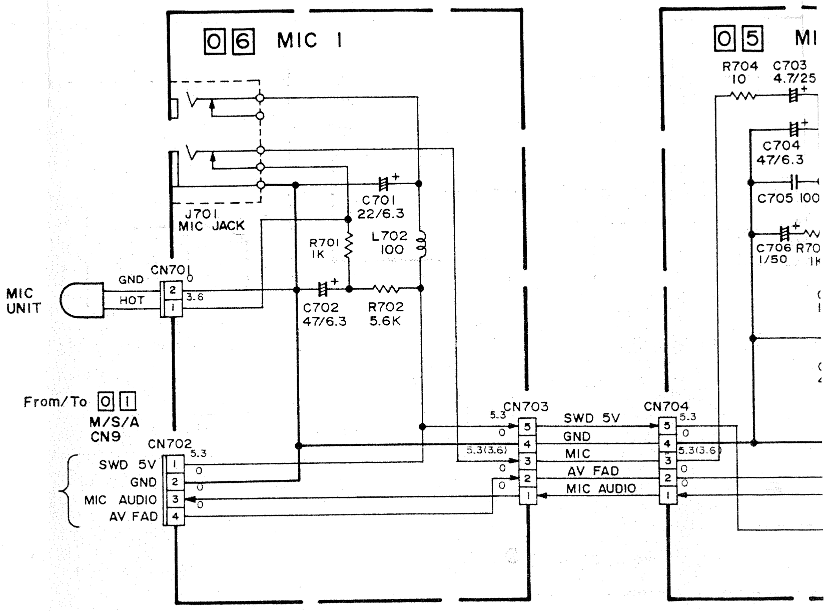
04 MECHA INT
17 MODE SENSOR
IC 601 BX7469
Q601 DTA124EF
IC 602 GP2L09BC
CN607
CN606
CN605
CN604
CN603
CN609
CN602
CN601
CN608
AL SW
REC SAFE SW
DEW SENSOR
CASS LED
TAPE SW
MODE CTL MOTOR
CAP MOTOR
R603 4.7K
R604 68
R605 0
R602 470
R601 1K
C601 1/50
NC
SWD 5V
GND
TAPE SW
GND
AL SW ON
M CTL
COUNT PULSE
SWD 5V
M DATE (B)
FG (+)
M DATE (A)
GND
MC MOTOR (+)
REV
MC MOTOR (−)
From/To 01 M/S/A CN3
FG (+)
GND
REV
GND
M CTL
SWD 5V
2R
R
M

5.15 MECHACON INTERFACE CIRCUIT BOARD



CN601
CN608
CN602
C601
CN606
CN607
CN605
CN604
CN603
R604
R601
R602
R603
R605
IC602
Q601
IC 601
04 MECHACON INTERFACE PWB ASSY YB10013A3-02

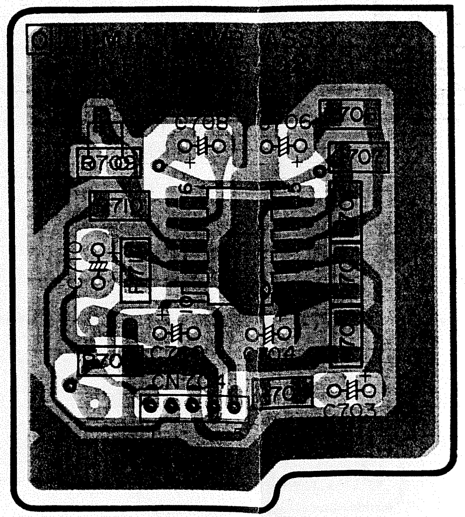
5.16 MIC 1 AND MIC 2 SCHEMATIC DIAGRAM



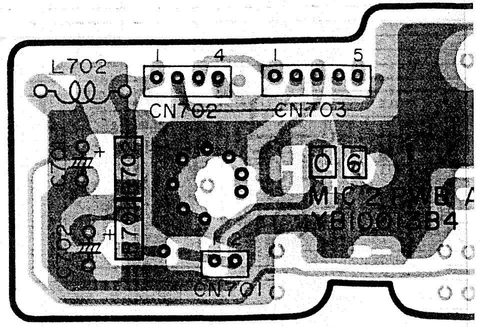
06 MIC 1
05 MI
MIC UNIT
J701 MIC JACK
CN701
CN702
CN703
CN704
C701 22/6.3
C702 47/6.3
R701 1K
R702 5.6K
L702 100
R704 10
C703 4.7/25
C704 47/6.3
C705 100
C706 1/50
From/To 01 M/S/A CN9
SWD 5V
GND
MIC AUDIO
AV FAD
MIC
HOT

5.17 MIC 1 MIC 2, START AND END SENSOR CIRCUIT BOARD

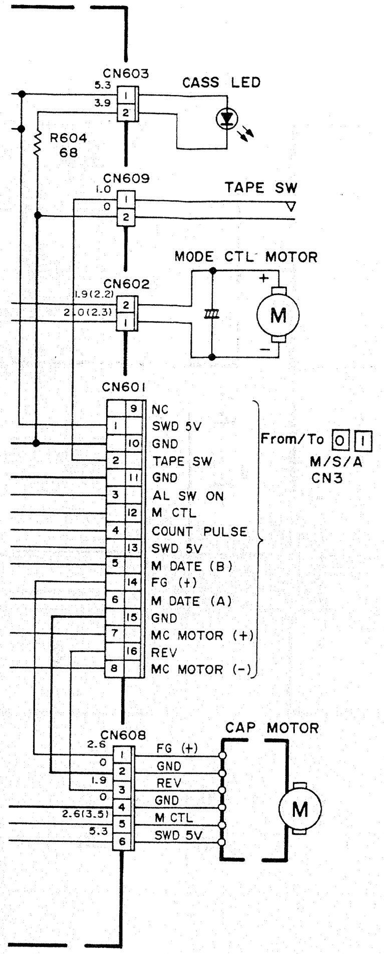
– MIC 1 –



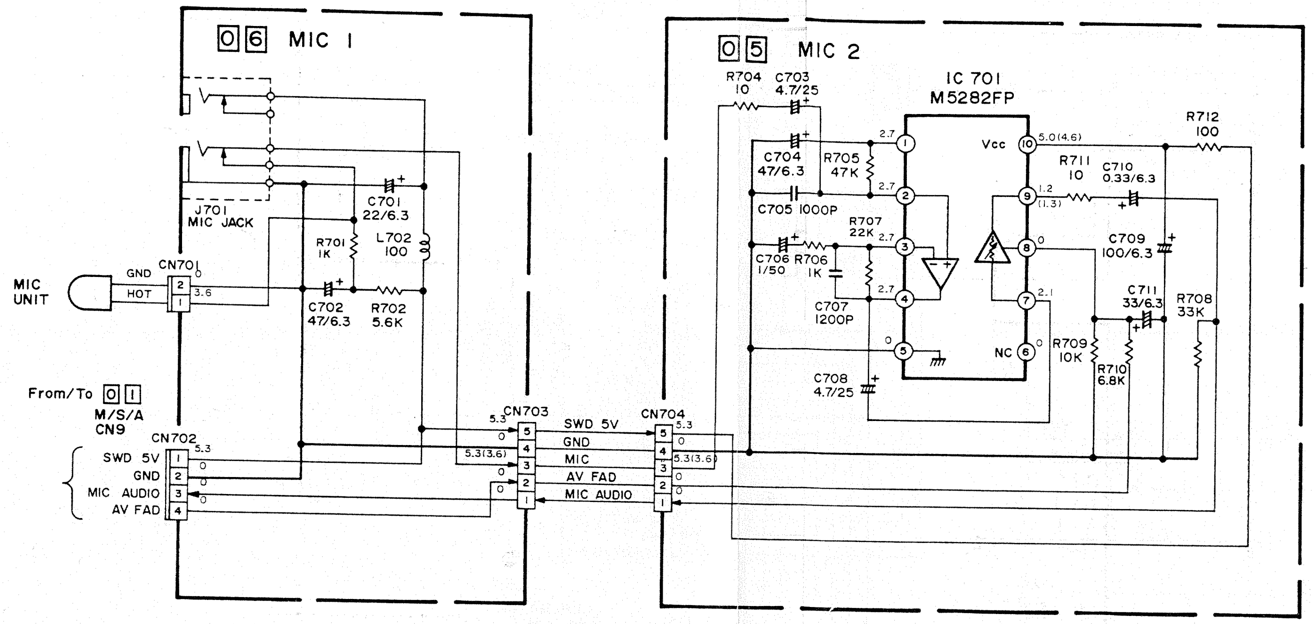
– MIC 2 –



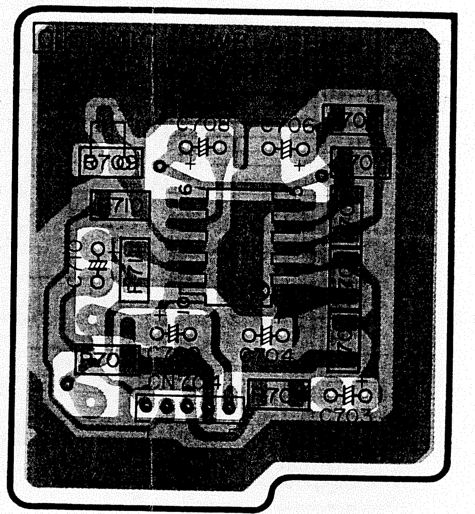
L702
CN702
CN703
CN701
06

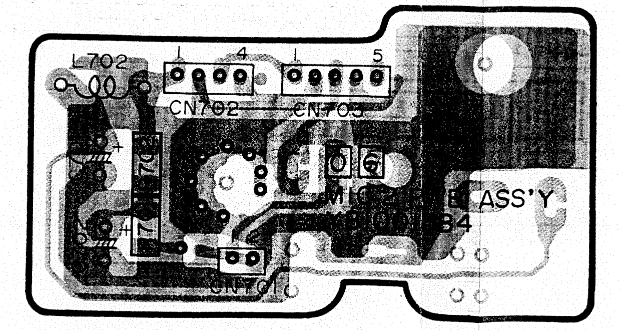

CN603
5.3
3.9
CASS LED
R604
68
CN609
1.0
0
TAPE SW
MODE CTL MOTOR
CN602
1.9(2.2)
2.0(2.3)
M
CN601
NC
SWD 5V
GND
TAPE SW
GND
AL SW ON
M CTL
COUNT PULSE
SWD 5V
M DATE (B)
FG (+)
M DATE (A)
GND
MC MOTOR (+)
REV
MC MOTOR (-)
From/To 01
M/S/A
CN3
CN608
CAP MOTOR
FG (+)
GND
REV
GND
M CTL
SWD 5V
2.6
1.9
2.6(3.5)
5.3
M

5.16 MIC 1 AND MIC 2 SCHEMATIC DIAGRAM

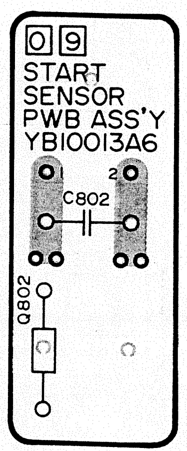

06 MIC 1
J701
MIC JACK
C701
22/6.3
L702
100
R701
1K
C702
47/6.3
R702
5.6K
MIC
UNIT
GND
HOT
CN701
3.6
From/To 01
M/S/A
CN9
CN702
SWD 5V
GND
MIC AUDIO
AV FAD
5.3
CN703
SWD 5V
GND
MIC
AV FAD
MIC AUDIO
5.3(3.6)
CN704
05 MIC 2
R704
10
C703
4.7/25
IC 701
M5282FP
Vcc
5.0(4.6)
R712
100
C704
47/6.3
R705
47K
C705 1000P
R707
22K
C706
1/50
R706
1K
C707
1200P
C708
4.7/25
2.7
R711
10
C710
0.33/6.3
1.2
(1.3)
C709
100/6.3
C711
33/6.3
R708
33K
2.1
R709
10K
R710
6.8K
NC

5.17 MIC 1 MIC 2, START AND END SENSOR CIRCUIT BOARD

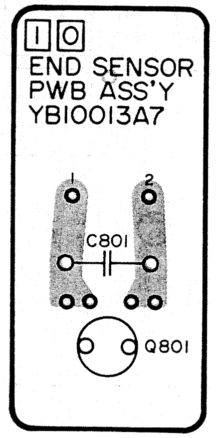

– MIC 1 –


– MIC 2 –

L702
4
5
CN702
CN703
06
ASS'Y

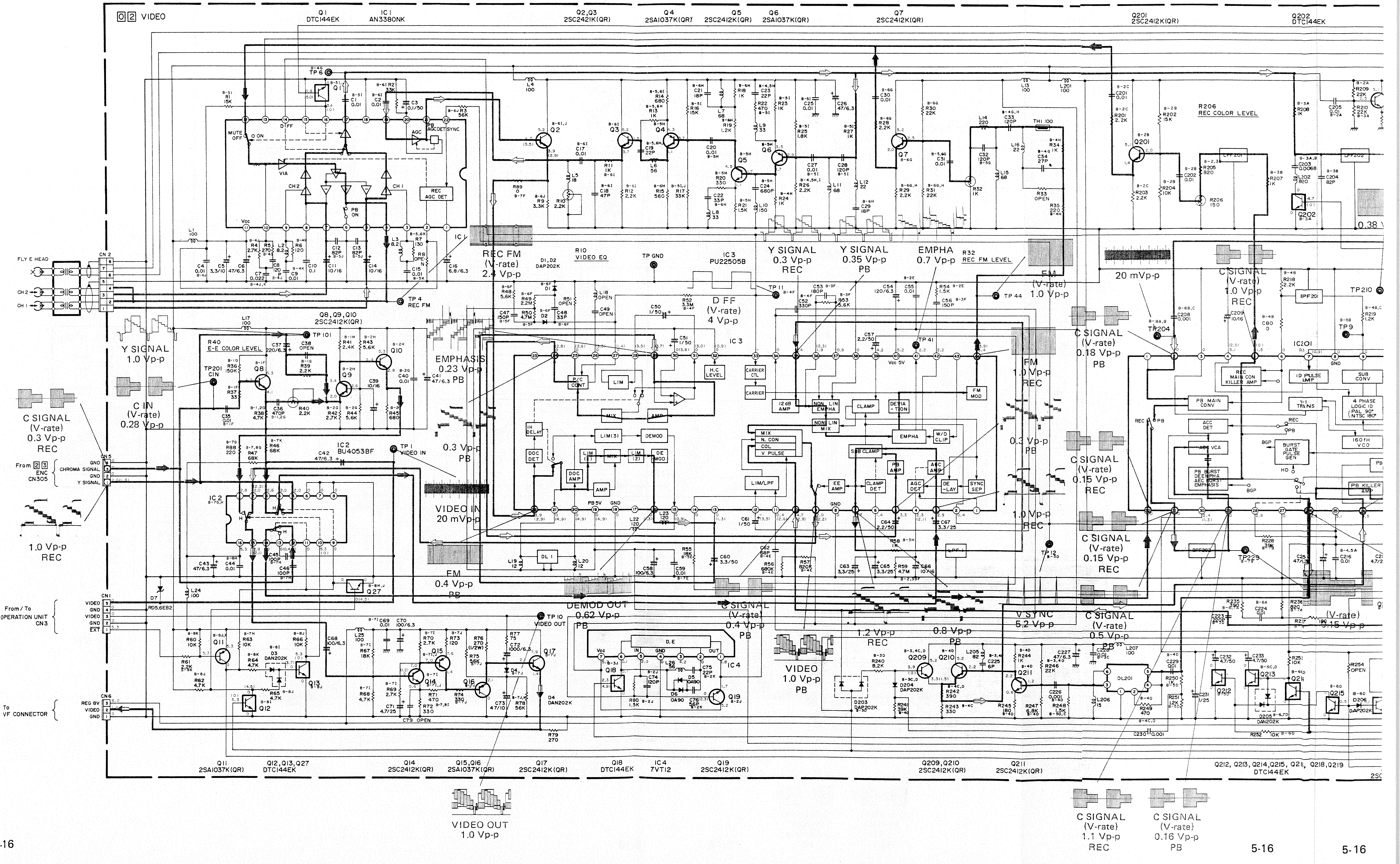

– START SENSOR –

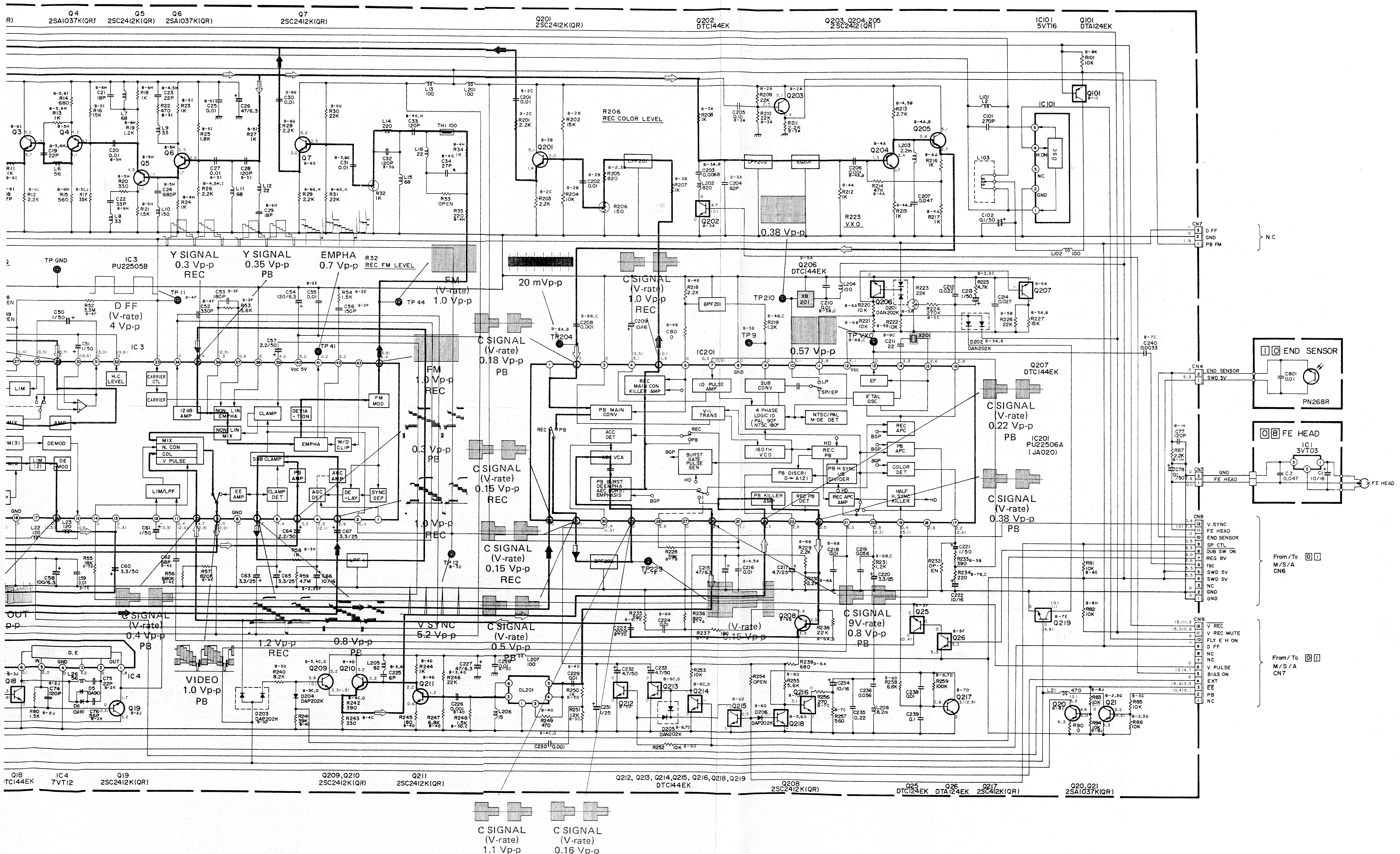
09
START
SENSOR
PWB ASS'Y
YB10013A6
1
2
C802
Q802


– END SENSOR –

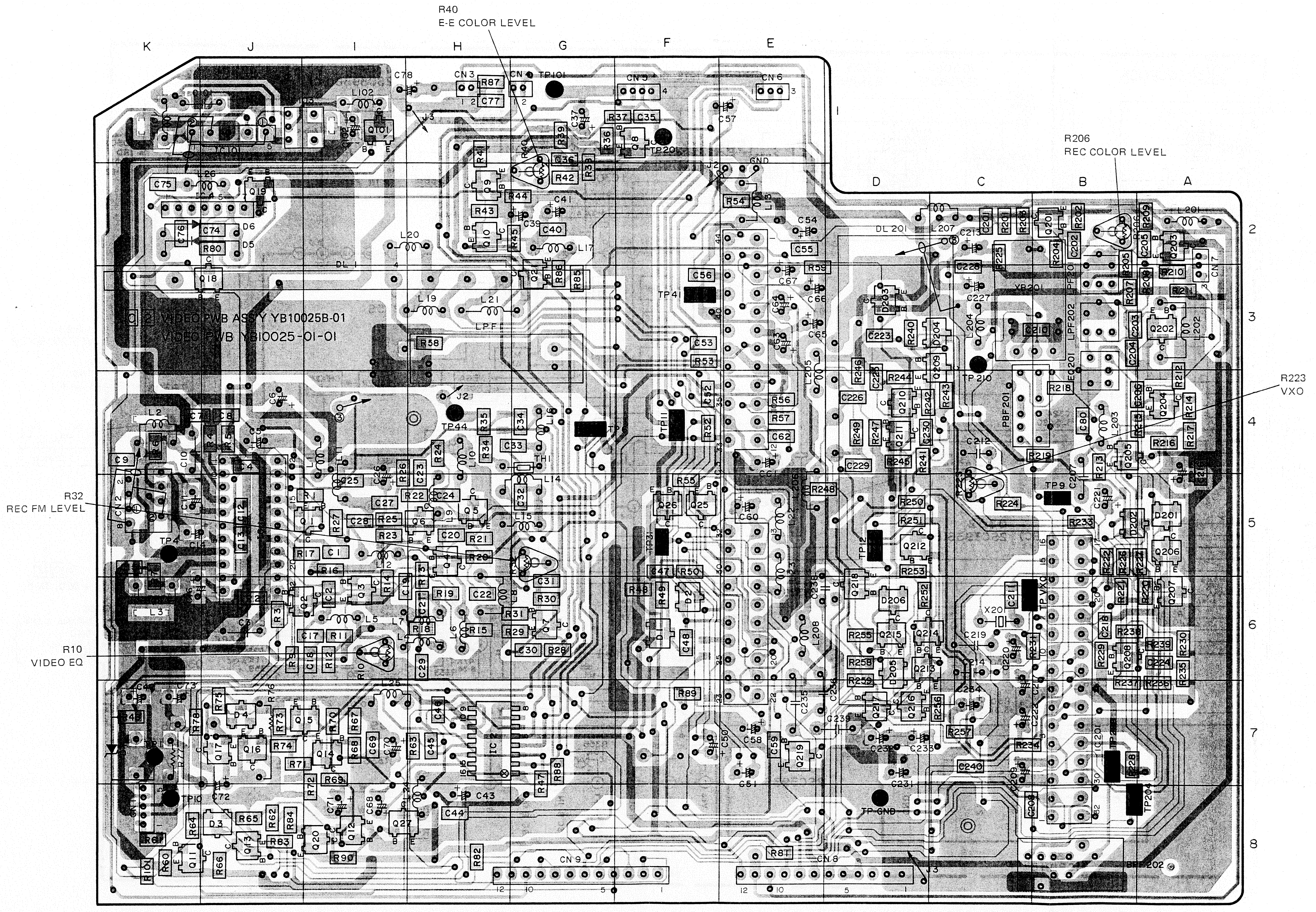
10
END SENSOR
PWB ASS'Y
YB10013A7
1
2
C801
Q801

5.18 VIDEO (DECK) SCHEMATIC DIAGRAM


02 VIDEO
Q1 DTC144EK
IC1 AN3380NK
Q2,Q3 2SC2421K(QR)
Q4 2SA1037K(QR)
Q5 2SC2412K(QR)
Q6 2SA1037K(QR)
Q7 2SC2412K(QR)
Q201 2SC2412K(QR)
Q202 DTC144EK
FLY E HEAD
CH 2
CH 1
MUTE OFF
ON
DIFF
VIA
AGC
AGC DET SYNC
REC AGC DET
PB ON
R206 REC COLOR LEVEL
REC FM (V-rate) 2.4 Vp-p
R10 VIDEO EQ
TP GND
IC3 PU22505B
Y SIGNAL 0.3 Vp-p REC
Y SIGNAL 0.35 Vp-p PB
EMPHA 0.7 Vp-p
R32 REC FM LEVEL
FM (V-rate) 1.0 Vp-p
20 mVp-p
C SIGNAL (V-rate) 1.0 Vp-p REC
TP210
TP4 REC FM
TP44
D FF (V-rate) 4 Vp-p
Q8,Q9,Q10 2SC2412K(QR)
TP101
R40 E-E COLOR LEVEL
Y SIGNAL 1.0 Vp-p
TP201 CIN
C IN (V-rate) 0.28 Vp-p
EMPHASIS 0.23 Vp-p PB
C SIGNAL (V-rate) 0.18 Vp-p PB
TP204
TP9
IC201
C SIGNAL (V-rate) 0.3 Vp-p REC
From 23 ENC CN305
GND
CHROMA SIGNAL
Y SIGNAL
1.0 Vp-p REC
IC2 BU4053BF
TP1 VIDEO IN
0.3 Vp-p PB
VIDEO IN 20 mVp-p
FM 1.0 Vp-p REC
0.3 Vp-p PB
C SIGNAL (V-rate) 0.15 Vp-p REC
1.0 Vp-p REC
C SIGNAL (V-rate) 0.15 Vp-p REC
FM 0.4 Vp-p PB
P/C CONT
LIM
MIX
AMP
H,C LEVEL
CARRIER CTL
CARRIER
12dB AMP
NON LIN EMPHA
NON LIN MIX
CLAMP
DEVIA-TION
FM MOD
EMPHA
W/D CLIP
1H DELAY
LIM(3)
DEMOD
DOC DET
DOC AMP
LIM(1)
LIM(2)
DE MOD
MIX
N. CON
COL
V PULSE
LIM/LPF
SUB CLAMP
PB AMP
EE AMP
CLAMP DET
AGC DET
AGC AMP
DE-LAY
SYNC SEP
PB 5V
REC MAIN CON KILLER AMP
ID PULSE AMP
SUB CONV
PB MAIN CONV
4 PHASE LOGIC ID PAL 90° NTSC 180°
ACC DET
ACC VCA
BURST GATE PULSE GEN
160fH VCO
PB BURST DEEMPHA ACC BURST EMPHASIS
PB KILLER AMP
BPF201
BPF202
LPF201
LPF202
DL1
DL201
TP12
TP229
From/To OPERATION UNIT CN3
CN1
VIDEO
GND
EXT
To VF CONNECTOR
CN6
REG 8V
TP10 VIDEO OUT
DEMOD OUT 0.62 Vp-p PB
C SIGNAL (V-rate) 0.4 Vp-p PB
VIDEO 1.0 Vp-p PB
1.2 Vp-p REC
0.8 Vp-p PB
V SYNC 5.2 Vp-p
C SIGNAL (V-rate) 0.5 Vp-p PB
(V-rate) 0.15 Vp-p
IC4
Q11 2SA1037K(QR)
Q12,Q13,Q27 DTC144EK
Q14 2SC2412K(QR)
Q15,Q16 2SA1037K(QR)
Q17 2SC2412K(QR)
Q18 DTC144EK
IC4 7VT12
Q19 2SC2412K(QR)
Q209,Q210 2SC2412K(QR)
Q211 2SC2412K(QR)
Q212, Q213, Q214,Q215, Q218,Q219 DTC144EK
VIDEO OUT 1.0 Vp-p
C SIGNAL (V-rate) 1.1 Vp-p REC
C SIGNAL (V-rate) 0.16 Vp-p PB


Q4 2SA1037K(QR)
Q5 2SC2412K(QR)
Q6 2SA1037K(QR)
Q7 2SC2412K(QR)
Q201 2SC2412K(QR)
Q202 DTC144EK
Q203, Q204, 205 2SC2412(QR)
IC101 5VT16
Q101 DTA124EK
R206 REC COLOR LEVEL
VXO
0.38 Vp-p
IC3 PU22505B
TP GND
TP 11
Y SIGNAL 0.3 Vp-p REC
Y SIGNAL 0.35 Vp-p PB
EMPHA 0.7 Vp-p
R32 REC FM LEVEL
TP 44
FM (V-rate) 1.0 Vp-p
D FF (V-rate) 4 Vp-p
20 mVp-p
C SIGNAL (V-rate) 1.0 Vp-p REC
Q206 DTC144EK
TP210
TP204
TP9
TP VXO
0.57 Vp-p
C SIGNAL (V-rate) 0.18 Vp-p PB
FM 1.0 Vp-p REC
0.3 Vp-p PB
1.0 Vp-p REC
C SIGNAL (V-rate) 0.15 Vp-p REC
C SIGNAL (V-rate) 0.15 Vp-p REC
IC201
Q207 DTC144EK
C SIGNAL (V-rate) 0.22 Vp-p PB
IC201 PU22506A (JA020)
C SIGNAL (V-rate) 0.38 Vp-p PB
TP12
TP229
C SIGNAL (V-rate) 0.4 Vp-p PB
VIDEO 1.0 Vp-p PB
1.2 Vp-p REC
0.8 Vp-p PB
V SYNC 5.2 Vp-p
C SIGNAL (V-rate) 0.5 Vp-p
(V-rate) 0.15 Vp-p
C SIGNAL (V-rate) 0.8 Vp-p PB
IC4
DL201
CN7
D FF
GND
PB FM
NC
CN4
END SENSOR
SWD 5V
10 END SENSOR
PN268R
08 FE HEAD
IC1 3VT03
FE HEAD
CN3
CN8
V SYNC
FE HEAD
END SENSOR
SP CTL
DUB SW ON
REG 8V
fsc
SWD 5V
SWD 5V
NC
GND
GND
From/To 01 M/S/A CN6
CN9
V REC
V REC MUTE
FLY E H ON
D FF
NC
NC
V PULSE
BIAS ON
EXT
EE
PB
NC
From/To 01 M/S/A CN7
Q18 DTC144EK
IC4 7VT12
Q19 2SC2412K(QR)
Q209, Q210 2SC2412K(QR)
Q211 2SC2412K(QR)
Q212, Q213, Q214, Q215, Q216, Q218, Q219 DTC144EK
Q208 2SC2412K(QR)
Q25 DTC124EK
Q26 DTA124EK
Q217 2SC2412K(QR)
Q20, Q21 2SA1037K(QR)
C SIGNAL (V-rate) 1.1 Vp-p REC
C SIGNAL (V-rate) 0.16 Vp-p PB

5.19 VIDEO CIRCUIT BOARD



R40
E-E COLOR LEVEL

R206
REC COLOR LEVEL

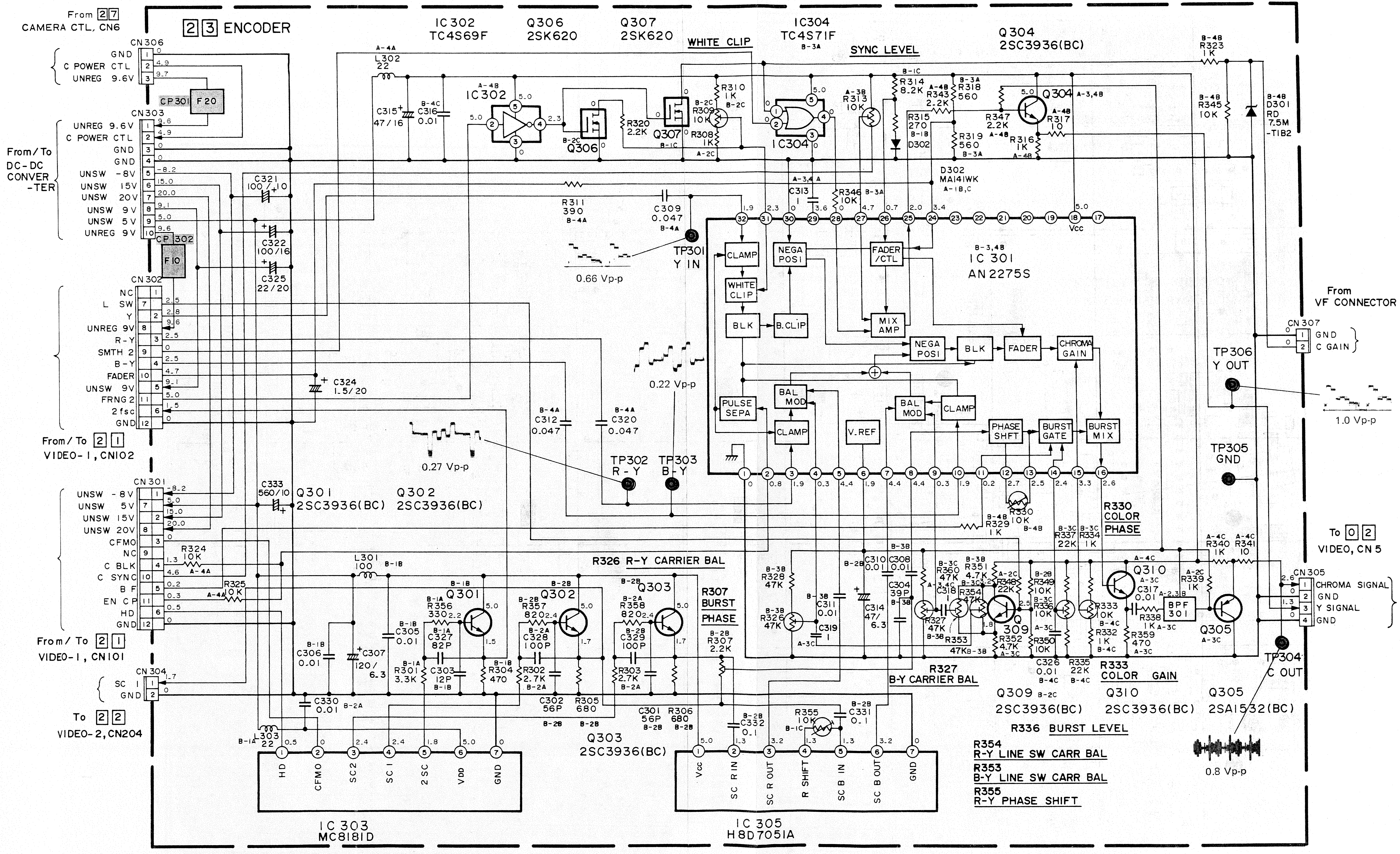
R223
VXO

R32
REC FM LEVEL

R10
VIDEO EQ

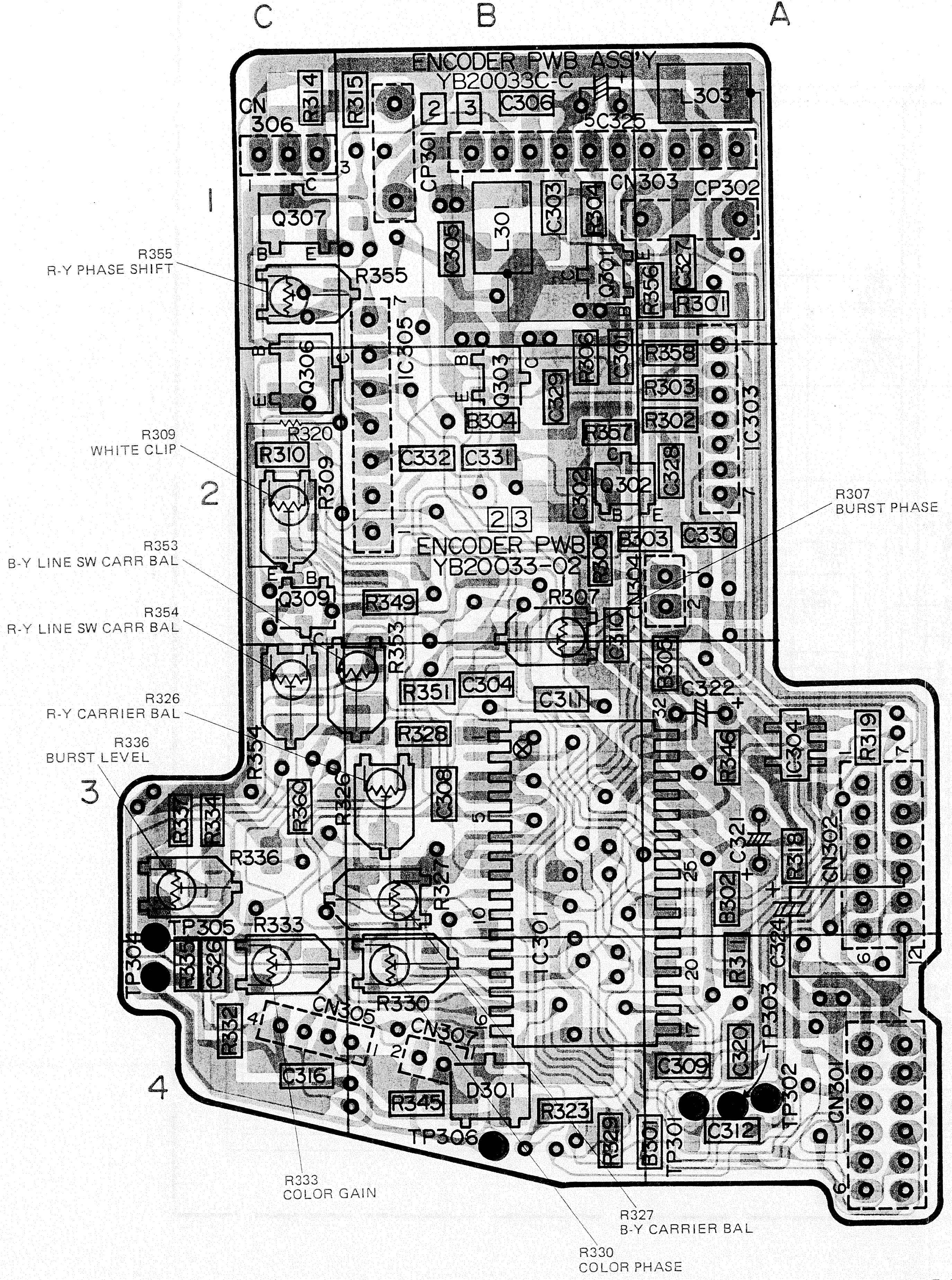
K
J
I
H
G
F
E
D
C
B
A
2
3
4
5
6
7
8
VIDEO PWB ASS'Y YB10025B-01
VIDEO PWB YB10025-01-01
CN3
CN4
CN5
CN6
CN7
CN8
CN9
CN2
TP101
TP201
TP41
TP44
TP4
TP10
TP9
TP11
TP12
TP13
TP210
TP204
TP-GND
GND
IC101
IC201
DL1
DL201
LPF
LPF201
LPF202
BPF201
BPF202
XB201
X201
J2
J3

5.20 ENCODER SCHEMATIC DIAGRAM

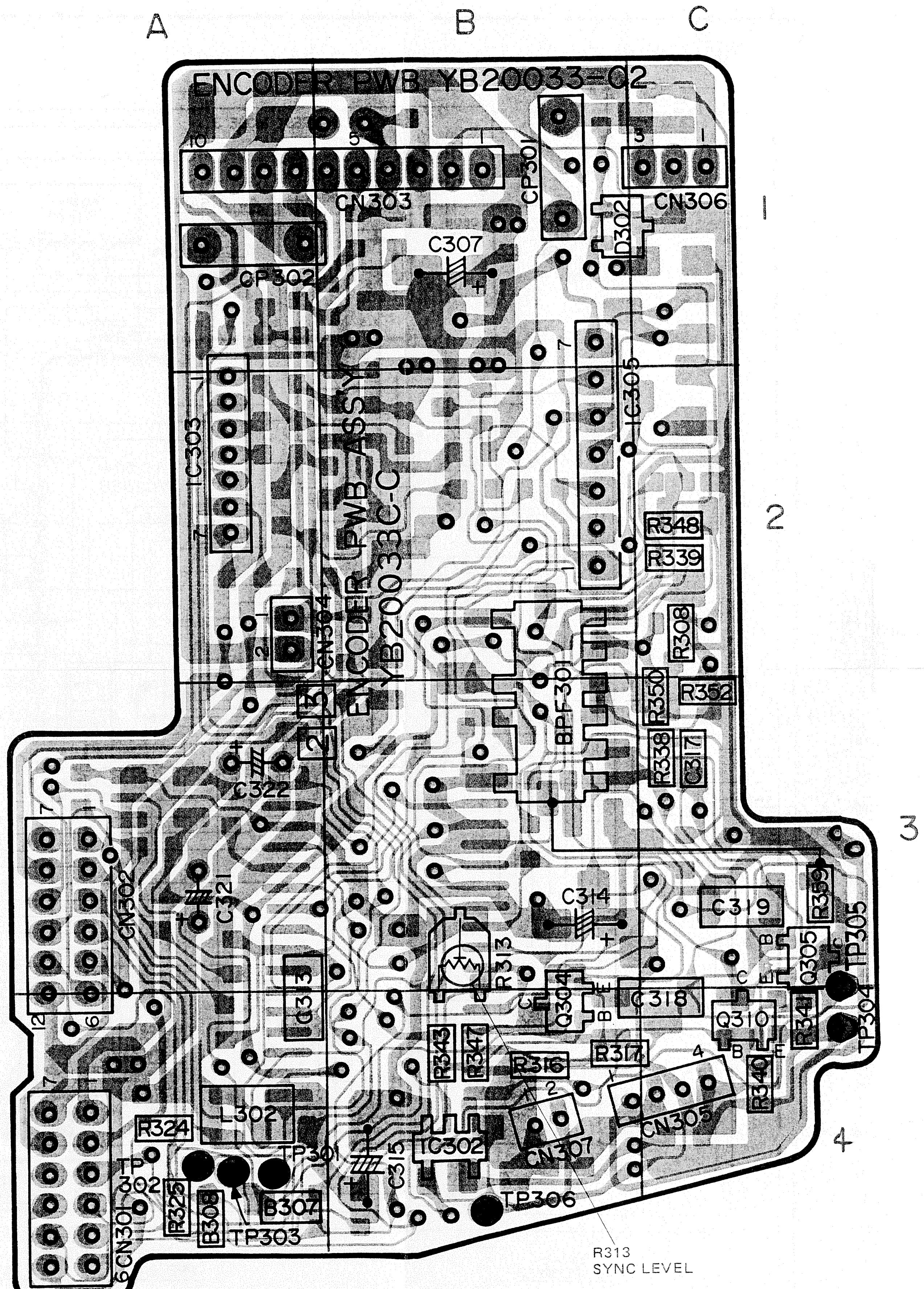

2 3 ENCODER
From 2 7 CAMERA CTL, CN6
CN306
GND
C POWER CTL
UNREG 9.6V
CP301 F20
CN303
UNREG 9.6V
C POWER CTL
GND
GND
UNSW -8V
UNSW 15V
UNSW 20V
UNSW 9V
UNSW 5V
UNREG 9V
From/To DC-DC CONVERTER
CP302 F10
CN302
NC
L SW
Y
UNREG 9V
R-Y
SMTH 2
B-Y
FADER
UNSW 9V
FRNG 2
2fsc
GND
From/To 2 1 VIDEO-1, CN102
CN301
UNSW -8V
UNSW 5V
UNSW 15V
UNSW 20V
CFMO
NC
C BLK
C SYNC
B F
EN CP
HD
GND
From/To 2 1 VIDEO-1, CN101
CN304
SC
GND
To 2 2 VIDEO-2, CN204
IC302 TC4S69F
Q306 2SK620
Q307 2SK620
WHITE CLIP
IC304 TC4S71F
SYNC LEVEL
Q304 2SC3936(BC)
L302 22
C315 47/16
C316 0.01
R320 2.2K
R310 1K
R309 10K
R308 1K
R313 10K
R314 8.2K
R343 2.2K
R318 560
R315 270
R319 560
D302
R347 2.2K
R317 10
R316 1K
R323 1K
R345 10K
D301 RD 7.5M -TIB2
D302 MA141WK
R311 390
C309 0.047
C313 1
R346 10K
C321 100/10
C322 100/16
C325 22/20
C324 1.5/20
TP301 Y IN
0.66 Vp-p
0.22 Vp-p
IC301 AN2275S
Vcc
CLAMP
NEGA POSI
FADER /CTL
WHITE CLIP
BLK
B.CLIP
MIX AMP
NEGA POSI
BLK
FADER
CHROMA GAIN
PULSE SEPA
BAL MOD
CLAMP
V.REF
BAL MOD
CLAMP
PHASE SHFT
BURST GATE
BURST MIX
From VF CONNECTOR
CN307
GND
C GAIN
TP306 Y OUT
1.0 Vp-p
TP305 GND
C312 0.047
C320 0.047
0.27 Vp-p
TP302 R-Y
TP303 B-Y
C333 560/10
Q301 2SC3936(BC)
Q302 2SC3936(BC)
R330 10K
R329 1K
R330 COLOR PHASE
R337 22K
R334 1K
R340 1K
R341 10
To 0 2 VIDEO, CN5
R324 10K
R325 10K
L301 100
R326 R-Y CARRIER BAL
Q301
R356 330
C327 82P
R357 820
C328 100P
Q302
Q303
R358 820
C329 100P
R307 BURST PHASE
R307 2.2K
C305 0.01
C306 0.01
C307 120/6.3
R301 3.3K
C303 12P
R304 470
R302 2.7K
R303 2.7K
C302 56P
R305 680
C301 56P
R306 680
C330 0.01
L303 22
Q303 2SC3936(BC)
R328 47K
R326 47K
C311 0.01
C319 1
C310 0.01
C308 0.01
C304 39P
C314 47/6.3
R360 47K
R351 4.7K
C318
R354 47K
R348 22K
R349 10K
R336 10K
R327 47K
R353 47K
Q309
R352 4.7K
R350 10K
R333 10K
R332 1K
Q310
C317 0.01
R338 1K
BPF 301
R359 470
R339 1K
Q305
CN305
CHROMA SIGNAL
GND
Y SIGNAL
GND
TP304 C OUT
C326 0.01
R335 22K
R333 COLOR GAIN
R327 B-Y CARRIER BAL
Q309 2SC3936(BC)
Q310 2SC3936(BC)
Q305 2SA1532(BC)
R336 BURST LEVEL
R354 R-Y LINE SW CARR BAL
R353 B-Y LINE SW CARR BAL
R355 R-Y PHASE SHIFT
0.8 Vp-p
R355 10K
C332 0.1
C331 0.1
HD
CFMO
SC2
SC1
2SC
VDD
GND
IC303 MC8181D
Vcc
SC R IN
SC R OUT
R SHIFT
SC B IN
SC B OUT
GND
IC305 H8D7051A

5.21 ENCODER CIRCUIT BOARD

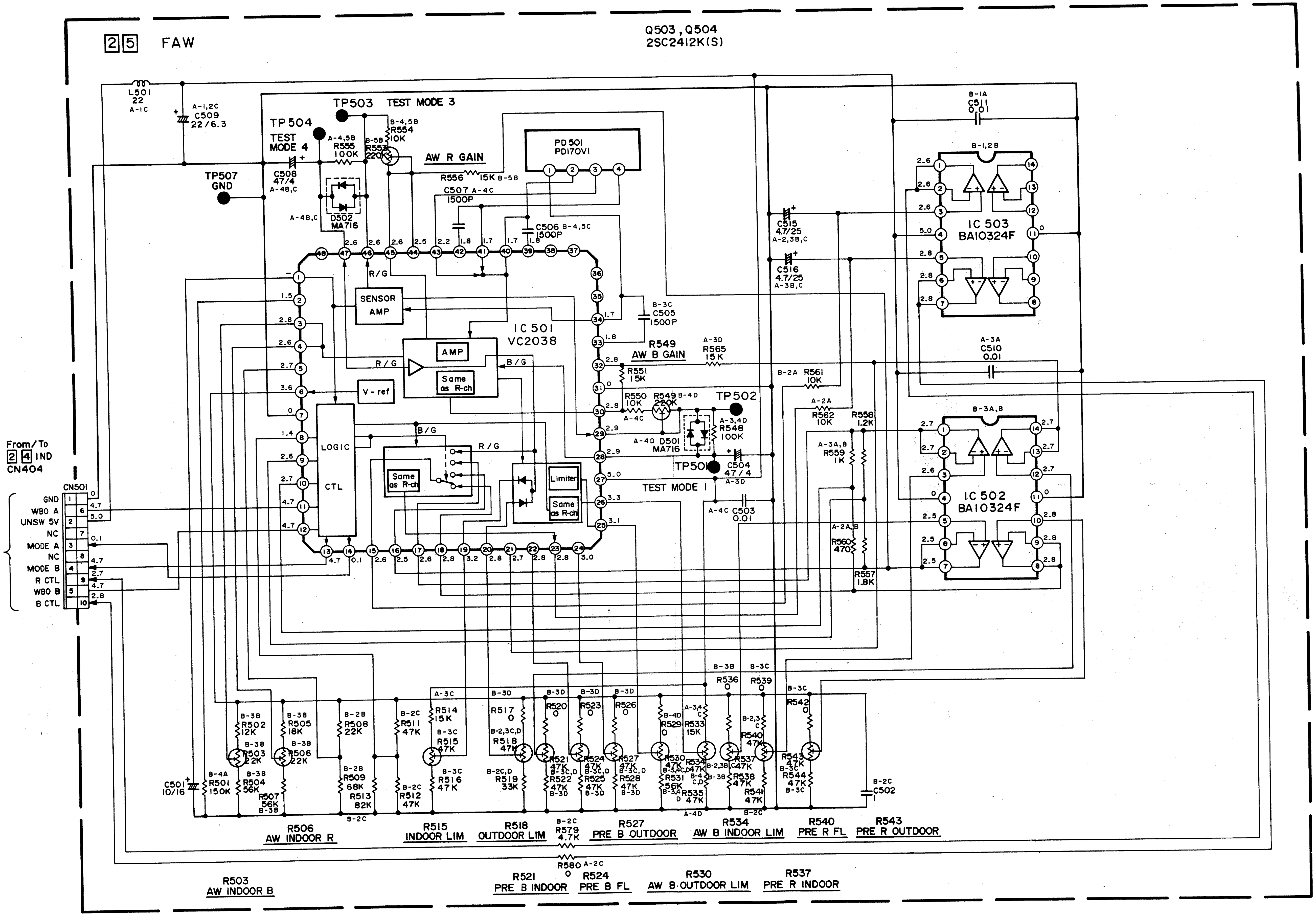
— Rear —


C
B
A
1
2
3
4
ENCODER PWB ASS'Y
YB20033C-C
ENCODER PWB
YB20033-02
R355
R-Y PHASE SHIFT
R309
WHITE CLIP
R353
B-Y LINE SW CARR BAL
R354
R-Y LINE SW CARR BAL
R326
R-Y CARRIER BAL
R336
BURST LEVEL
R307
BURST PHASE
R333
COLOR GAIN
R327
B-Y CARRIER BAL
R330
COLOR PHASE
TP304
TP305
TP306
TP301
TP302
TP303
IC301
IC303
IC304
IC305
CN301
CN302
CN303
CN304
CN305
CN306
CN307

— Front —

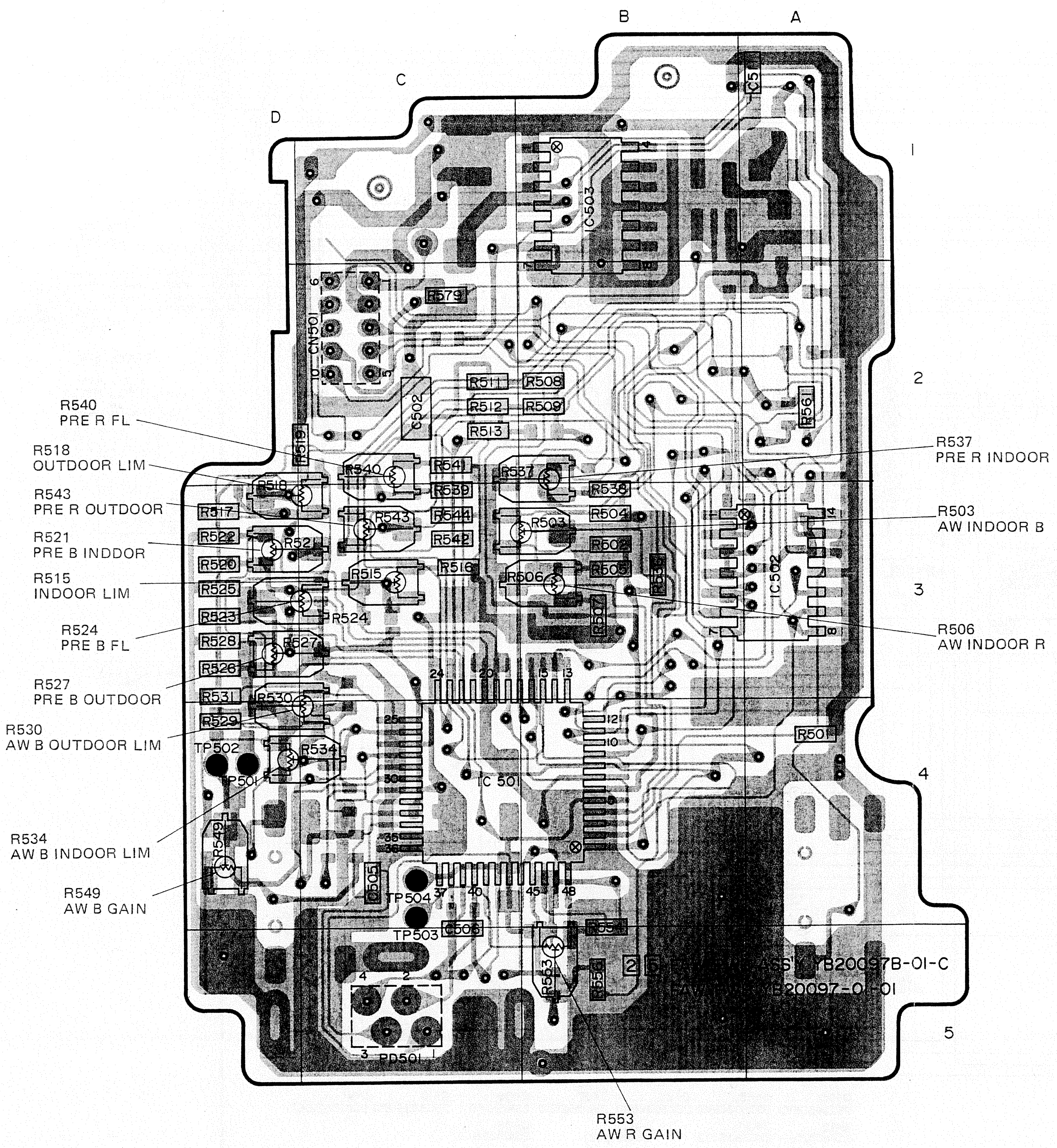

A
B
C
1
2
3
4
ENCODER PWB YB20033-02
ENCODER PWB ASS'Y
YB20033C-C
R313
SYNC LEVEL
TP301
TP302
TP303
TP304
TP305
TP306
IC302
IC303
IC305
BPF301
CN301
CN302
CN303
CN304
CN305
CN306
CN307

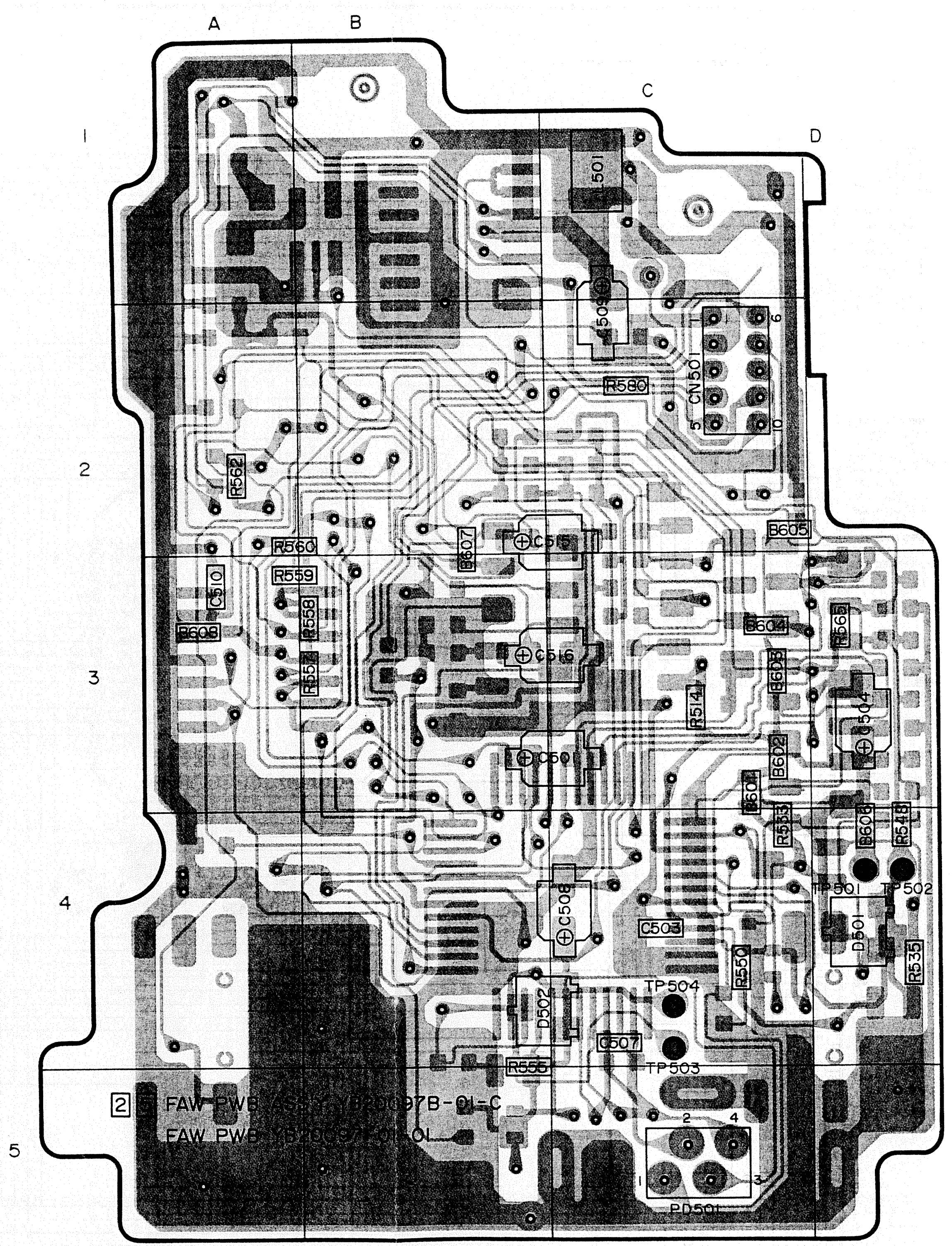
5.22 FAW SCHEMATIC DIAGRAM



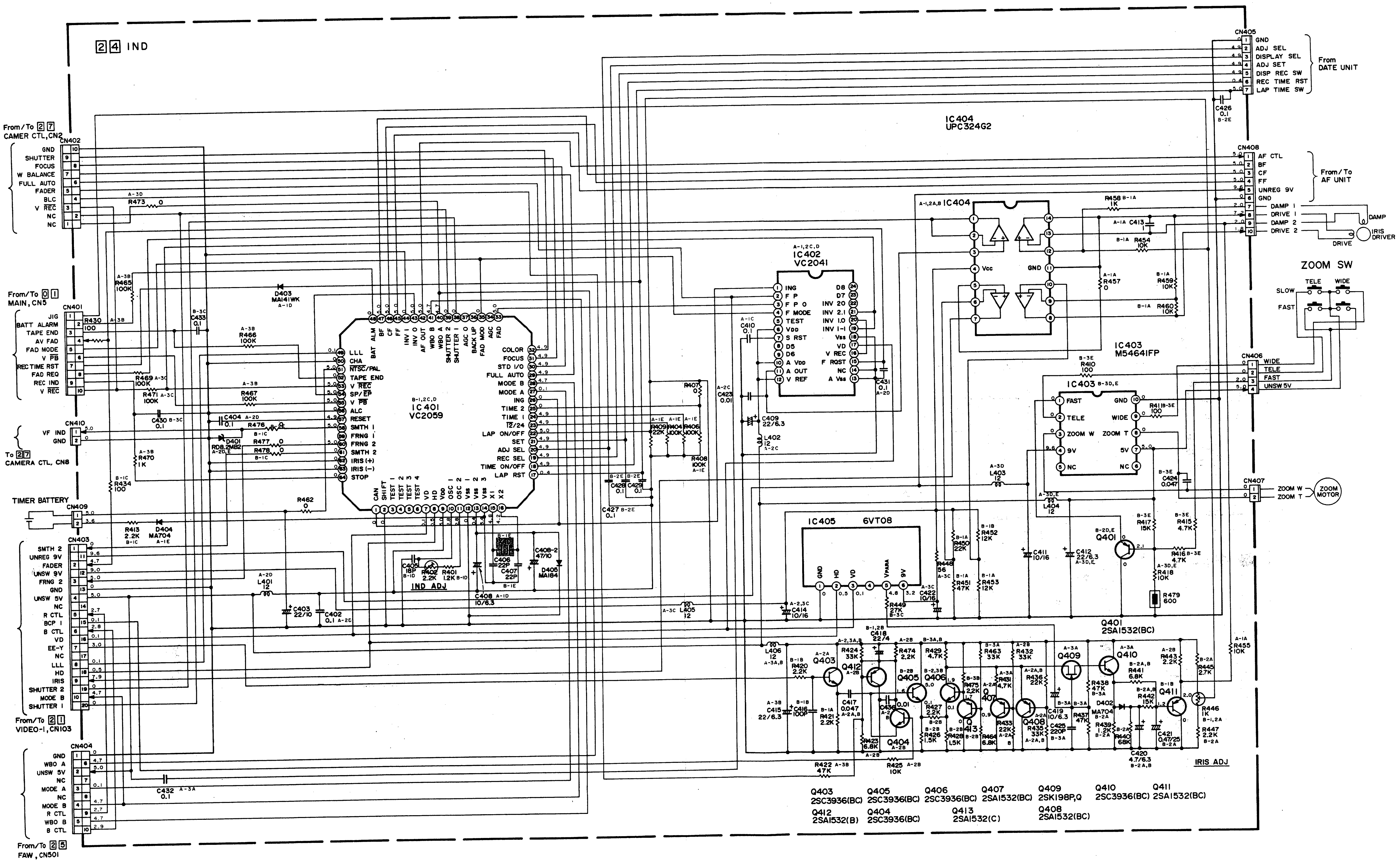
25 FAW
Q503, Q504
2SC2412K(S)
L501 22 A-1C
C509 22/6.3 A-1,2C
TP503 TEST MODE 3
TP504 TEST MODE 4
R554 10K B-4,5B
R555 100K A-4,5B
R553 220K B-5B
AW R GAIN
R556 15K B-5B
C507 1500P A-4C
PD501 PD170V1
C508 47/4 A-4B,C
TP507 GND
D502 MA716 A-4B,C
C506 1500P B-4,5C
SENSOR AMP
R/G
IC501 VC2038
C505 1500P B-3C
R549 AW B GAIN
R565 15K A-3D
AMP
Same as R-ch
B/G
V-ref
LOGIC CTL
R551 15K
R550 10K A-4C
R549 220K B-4D
TP502
R548 100K A-3,4D
D501 MA716 A-4D
TP501
C504 47/4 A-3D
TEST MODE 1
Limiter
Same as R-ch
C503 0.01 A-4C
From/To 24 IND CN404
CN501
GND
WBO A
UNSW 5V
NC
MODE A
NC
MODE B
R CTL
WBO B
B CTL
C511 0.01 B-1A
IC503 BA10324F B-1,2B
C515 47/25 A-2,3B,C
C516 4.7/25 A-3B,C
C510 0.01 A-3A
R561 10K B-2A
R562 10K A-2A
R558 1.2K
R559 1K A-3A,B
R560 470 A-2A,B
R557 1.8K
IC502 BA10324F B-3A,B
R536 0 B-3B
R539 0 B-3C
R542 0 B-3C
R501 150K B-4A
C501 10/16
R502 12K B-3B
R503 22K B-3B
R504 56K B-3B
R505 18K B-3B
R506 22K B-3B
R507 56K B-3B
R508 22K B-2B
R509 68K B-2B
R513 82K B-2C
R511 47K B-2C
R512 47K B-2C
R514 15K A-3C
R515 47K B-3C
R516 47K B-3C
R517 0 B-3D
R518 47K B-2,3C,D
R519 33K B-2C,D
R520 0 B-3D
R521 47K B-3C,D
R522 47K B-3D
R523 0 B-3D
R524 47K B-3C,D
R525 47K B-3D
R526 0 B-3D
R527 47K B-3C,D
R528 47K B-3D
R529 0 B-4D
R530 47K B-3,4C,D
R531 56K
R533 15K A-3,4C
R534 47K B-4C,D
R535 47K B-3,4D
R537 47K B-2,3B
R538 47K B-3B
R540 47K B-2,3C
R541 47K B-2C
R543 47K B-3C
R544 47K B-3C
C502 1 B-2C
R579 4.7K B-2C
R580 0 A-2C
R506 AW INDOOR R
R515 INDOOR LIM
R518 OUTDOOR LIM
R527 PRE B OUTDOOR
R534 AW B INDOOR LIM
R540 PRE R FL
R543 PRE R OUTDOOR
R503 AW INDOOR B
R521 PRE B INDOOR
R524 PRE B FL
R530 AW B OUTDOOR LIM
R537 PRE R INDOOR

5.23 FAW CIRCUIT BOARD


— Rear —
B
A
C
D
1
2
3
4
5
R540
PRE R FL
R518
OUTDOOR LIM
R543
PRE R OUTDOOR
R521
PRE B INDDOR
R515
INDOOR LIM
R524
PRE B FL
R527
PRE B OUTDOOR
R530
AW B OUTDOOR LIM
R534
AW B INDOOR LIM
R549
AW B GAIN
R537
PRE R INDOOR
R503
AW INDOOR B
R506
AW INDOOR R
R553
AW R GAIN
CN501
IC501
IC502
C502
C503
TP501
TP502
TP503
TP504
PD501
R501
R579
R511
R508
R512
R509
R513
R519
R517
R522
R520
R525
R523
R528
R526
R531
R529
R541
R539
R544
R542
R516
R538
R504
R502
R505
R507
R561
C505
C506
R554
FAW PWB ASSY YB20097B-01-C
FAW PWB YB20097-01-01

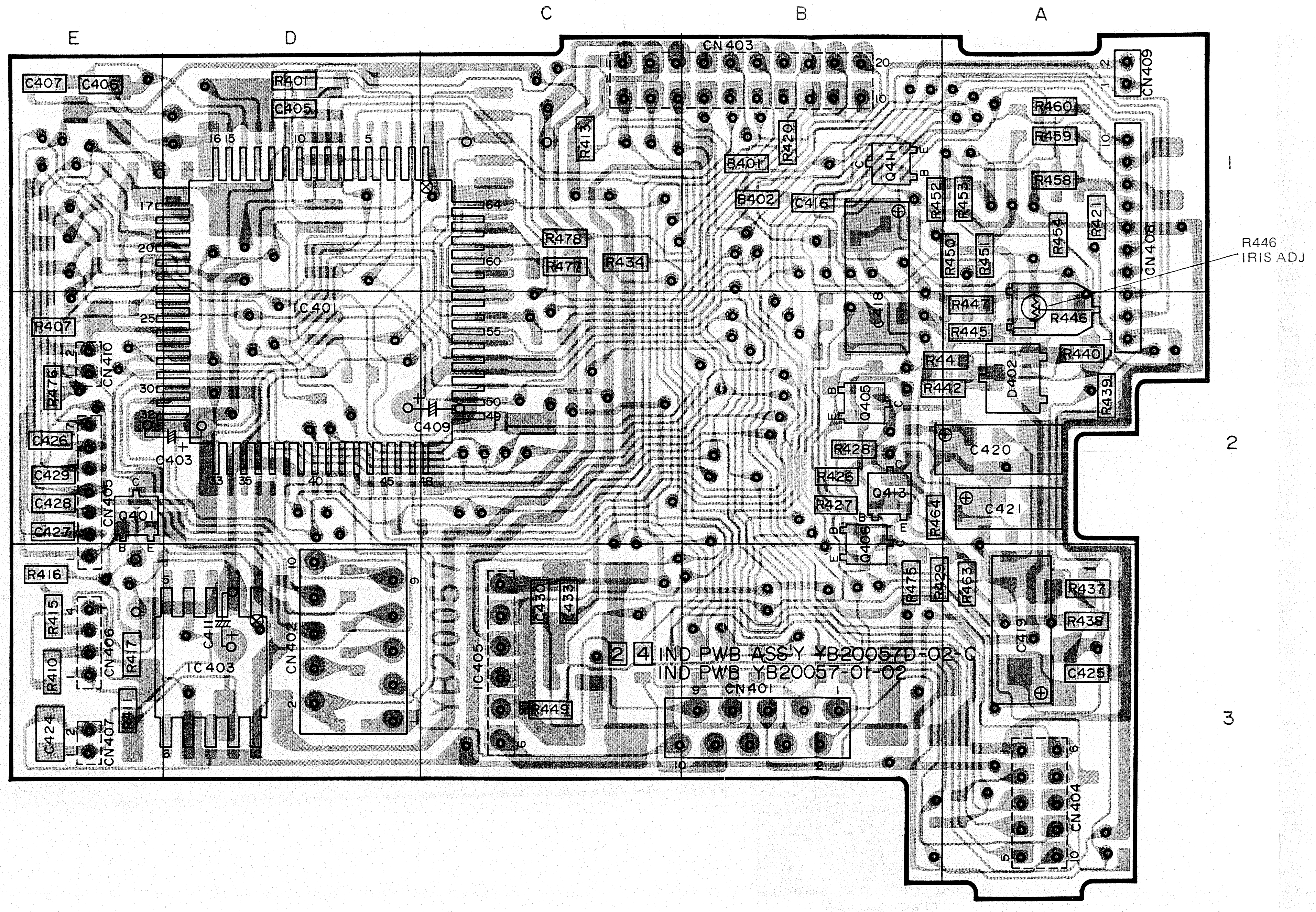

— Front —
A
B
C
D
1
2
3
4
5
CN501
R501
C509
R580
R562
R560
R559
R558
R557
C510
R608
R607
C515
C516
C501
R514
R605
R604
R603
R602
R601
R565
C504
R606
R548
R555
TP501
TP502
C502
C503
D501
R535
R550
D502
C507
R556
TP504
TP503
PD501
FAW PWB ASSY YB20097B-01-C
FAW PWB YB20097-01-01

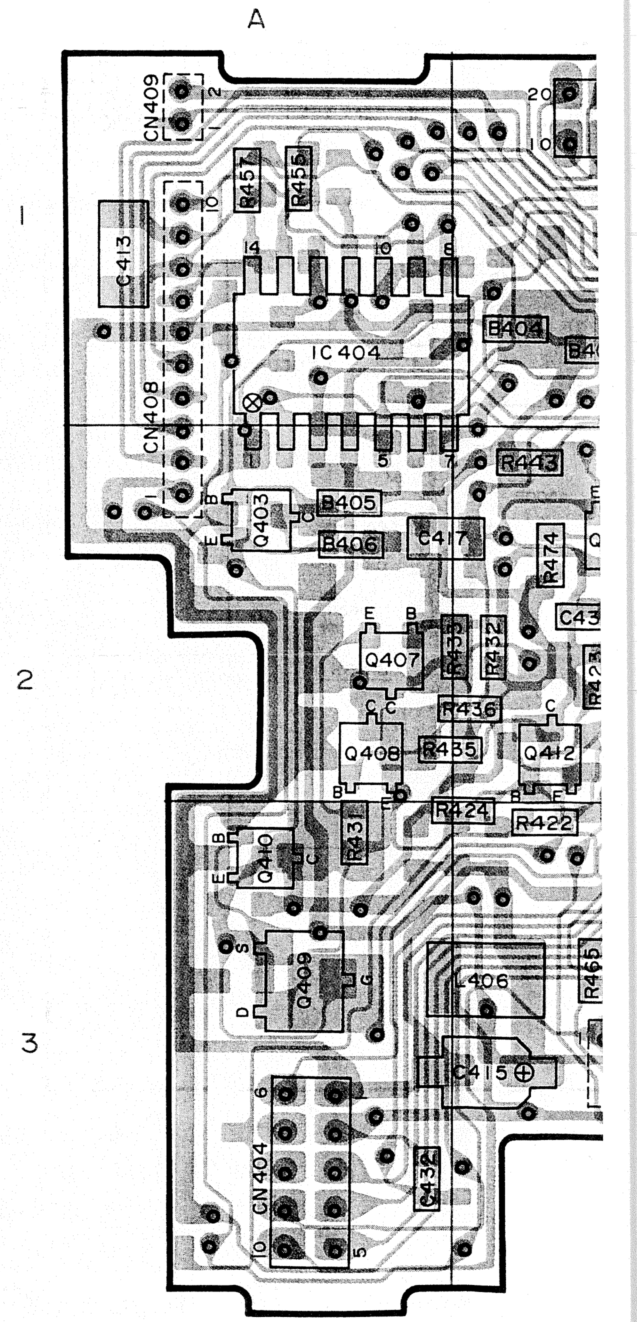
5.24 INDICATOR SCHEMATIC DIAGRAM

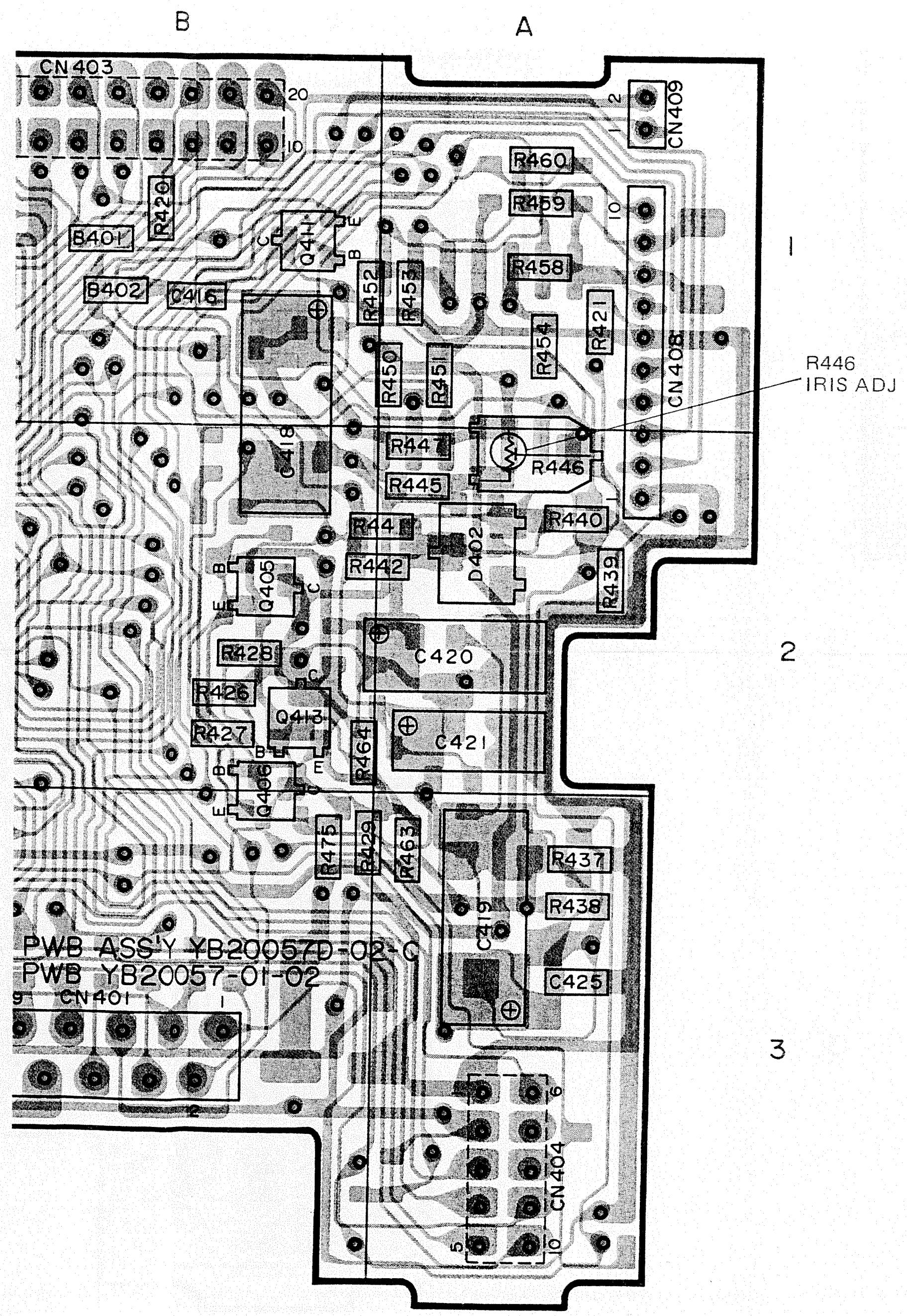

24 IND
From/To 27 CAMER CTL, CN2
CN402
GND
SHUTTER
FOCUS
W BALANCE
FULL AUTO
FADER
BLC
V REC
NC
NC
From/To 01 MAIN, CN5
CN401
JIG
BATT ALARM
TAPE END
AV FAD
FAD MODE
V PB
REC TIME RST
FAD REQ
REC IND
V REC
CN410
VF IND
GND
To 27 CAMERA CTL, CN8
TIMER BATTERY
CN409
CN403
SMTH 2
UNREG 9V
FADER
UNSW 9V
FRNG 2
GND
UNSW 5V
NC
R CTL
BCP 1
B CTL
VD
EE-Y
NC
LLL
HD
IRIS
SHUTTER 2
MODE B
SHUTTER 1
From/To 21 VIDEO-1, CN103
CN404
GND
WBO A
UNSW 5V
NC
MODE A
NC
MODE B
R CTL
WBO B
B CTL
From/To 25 FAW, CN501
R473 0
R465 100K
R430 100
D403 MA141WK
C433 0.1
R466 100K
R469 100K
R471 100K
R467 100K
C430 0.1
C404 0.1
R476
D401 RD8.2MB2
R477 0
R478 0
R470 1K
R434 100
R462 0
R413 2.2K
D404 MA704
IC401 VC2059
LLL
CHA
NTSC/PAL
TAPE END
V REC
SP/EP
V PB
ALC
RESET
SMTH 1
FRNG 1
FRNG 2
SMTH 2
IRIS (+)
IRIS (−)
STOP
BAT ALM
BF
CF
FF
INV 1
INV 0
AF OUT
WBO B
WBO A
SHUTTER 2
SHUTTER 1
AGC 0
BACK UP
FAD MOD
AGC
FAD
COLOR
FOCUS
STD I/O
FULL AUTO
MODE B
MODE A
ING
TIME 2
TIME 1
12/24
LAP ON/OFF
SET
ADJ SEL
REC SEL
TIME ON/OFF
LAP RST
CAN
SHIFT
TEST 1
TEST 2
TEST 3
TEST 4
VD
HD
VDD
OSC 1
OSC 2
VSS 2
VSS 3
X1
X2
C405 18P
R402 2.2K
R401 1.2K
C406 22P
C407 22P
C408-2 47/10
D405 MA184
C408 10/6.3
IND ADJ
L401 12
C403 22/10
C402 0.1
C432 0.1
R407 0
C423 0.01
C410 0.1
IC402 VC2041
ING
FP
F P O
F MODE
TEST
VDD
S RST
D5
D6
A VDD
A OUT
V REF
D8
D7
INV 20
INV 2.1
INV 1.0
INV 1-1
VSS
VD
V REC
F RDST
NC
A VSS
C431 0.1
C409 22/6.3
L402 12
R409 22K
R404 100K
R406 100K
R408 100K
C428 0.1
C429 0.1
C427 0.1
L405 12
C414 10/16
IC405 6VT08
GND
HD
VD
VPARA
9V
R449 27K
C422 10/16
IC404 UPC324G2
IC404
Vcc
GND
R458 1K
C413 1
R454 10K
R457 0
R459 10K
R460 10K
IC403 M5464IFP
R410 100
IC403
FAST
TELE
ZOOM W
9V
NC
GND
WIDE
ZOOM T
5V
NC
R418 100
C424 0.047
L403 12
L404 12
R452 12K
R450 22K
R448 56
R451 47K
R453 12K
C411 10/16
C412 22/6.3
Q401
R417 15K
R415 4.7K
R416 4.7K
R418 10K
R479 600
Q401 2SA1532(BC)
CN405
GND
ADJ SEL
DISPLAY SEL
ADJ SET
DISP REC SW
REC TIME RST
LAP TIME SW
From DATE UNIT
C426 0.1
CN408
AF CTL
BF
CF
FF
UNREG 9V
GND
DAMP 1
DRIVE 1
DAMP 2
DRIVE 2
From/To AF UNIT
DAMP
IRIS DRIVER
DRIVE
ZOOM SW
TELE
WIDE
SLOW
FAST
CN406
WIDE
TELE
FAST
UNSW 5V
CN407
ZOOM W
ZOOM T
ZOOM MOTOR
L406 12
R420 2.2K
Q403
R424 33K
C418 22/4
Q412
R474 2.2K
R429 4.7K
Q405
Q406
R463 33K
R432 33K
Q409
Q410
R443 2.2K
R445 2.7K
R455 10K
C415 22/6.3
C416 100P
R421 2.2K
C417 0.047
Q404
R423 16.8K
R427 2.2K
R426 1.5K
R428 1.5K
R475 2.2K
Q413
R431 4.7K
Q407
R464 6.8K
R433 22K
R436 22K
Q408
R435 33K
C419 10/6.3
C425 220P
R437 47K
R438 47K
R441 6.8K
D402 MA704
R439 1.2K
R440 68K
R442 15K
Q411
C421 0.47/25
C420 4.7/6.3
R446 1K
R447 2.2K
R422 47K
R425 10K
IRIS ADJ
Q403 2SC3936(BC)
Q405 2SC3936(BC)
Q406 2SC3936(BC)
Q407 2SA1532(BC)
Q409 2SK198P,Q
Q410 2SC3936(BC)
Q411 2SA1532(BC)
Q412 2SA1532(B)
Q404 2SC3936(BC)
Q413 2SA1532(C)
Q408 2SA1532(BC)

5.25 INDICATOR CIRCUIT BOARD

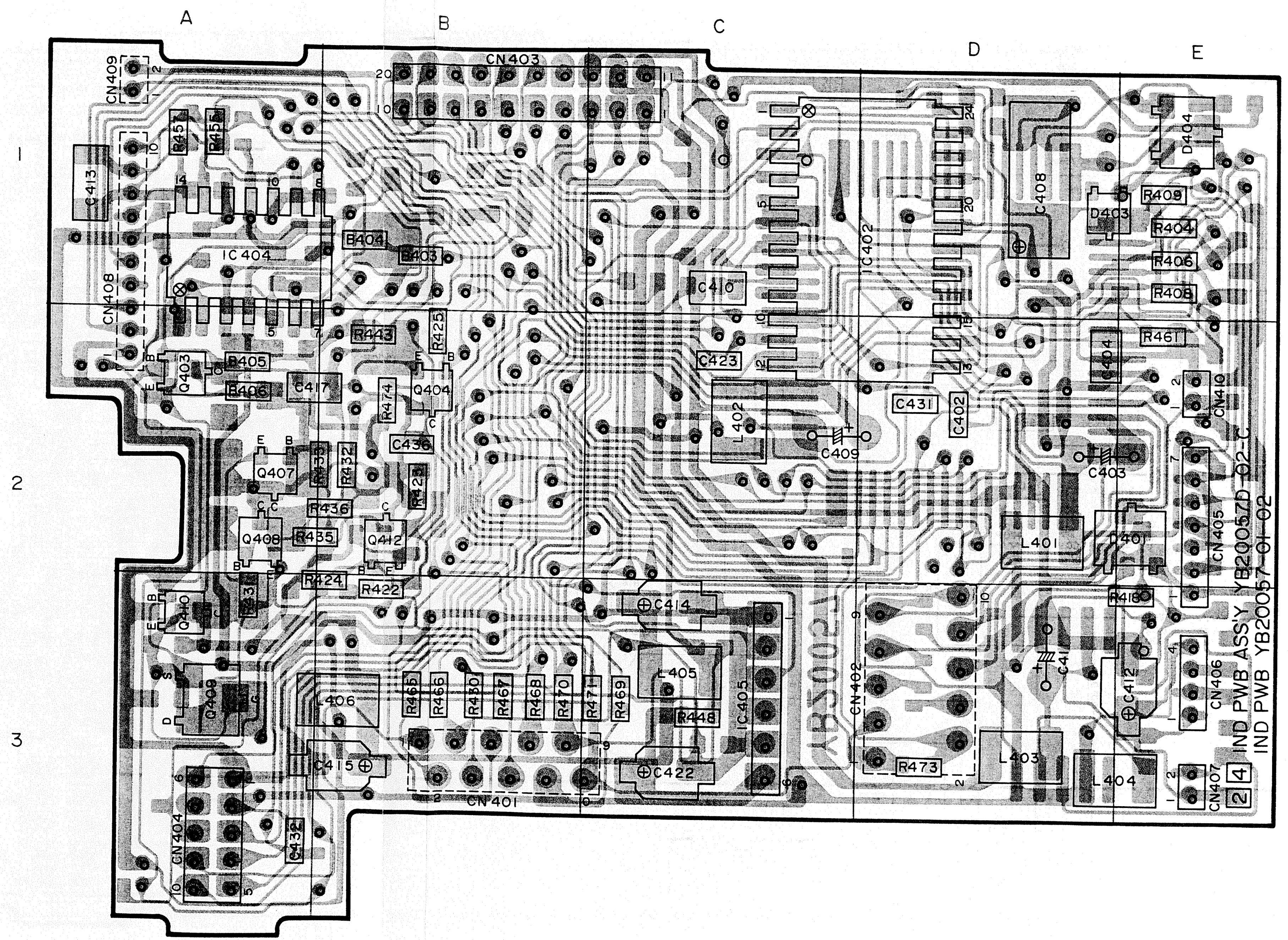
— Rear —


E
D
C
B
A
1
2
3
CN403
CN409
CN408
CN410
CN405
CN406
CN407
CN402
CN401
CN404
IC401
IC403
IC405
Q401
Q405
Q406
Q411
Q413
D402
C403
C405
C406
C407
C409
C411
C416
C418
C419
C420
C421
C424
C425
C426
C427
C428
C429
C430
R401
R402
R407
R410
R413
R415
R416
R417
R420
R421
R426
R427
R428
R429
R433
R434
R437
R438
R439
R440
R442
R445
R446
R447
R449
R450
R451
R452
R453
R454
R458
R459
R460
R463
R464
R475
R476
R477
R478
R446
IRIS ADJ
2 4 IND PWB ASS'Y YB20057D-02-C
IND PWB YB20057-01-02
YB20057

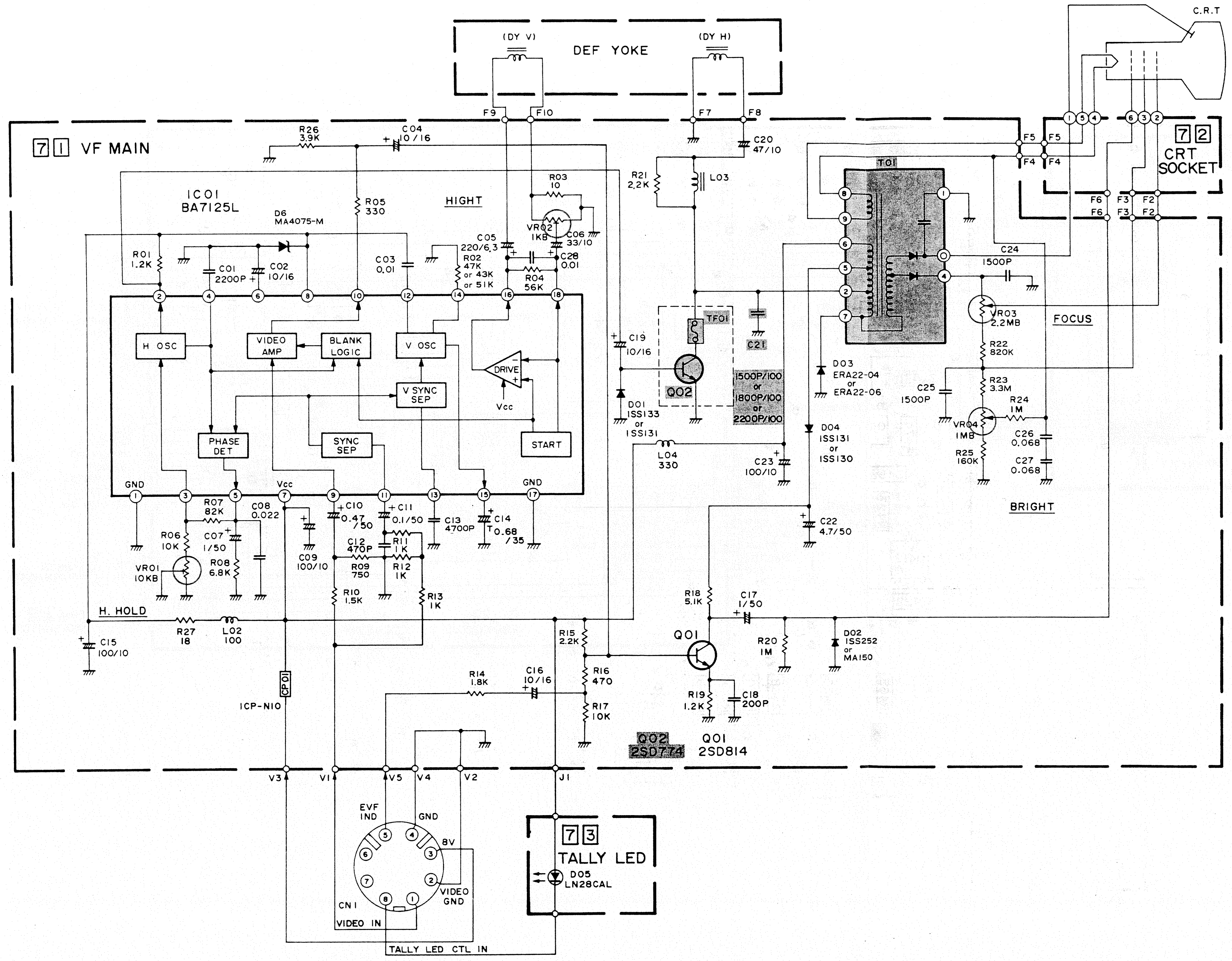

A
1
2
3
CN409
CN408
CN404
IC404
Q403
Q407
Q408
Q409
Q410
Q412
C413
C415
C417
C432
L406
R404
R405
R406
R422
R424
R431
R432
R435
R436
R443
R455
R457
R465
R474


B
A
1
2
3
CN403
CN409
CN408
CN401
CN404
R446
IRIS ADJ
R460
R459
R458
R421
R454
R452
R453
R450
R451
R447
R445
R444
R442
R440
R439
R401
R402
R420
C416
Q411
C418
D402
Q405
R428
R426
R427
Q413
Q406
C420
C421
R464
R475
R429
R463
R437
R438
C419
C425
PWB ASS'Y YB20057D-02-C
PWB YB20057-01-02

— Front —

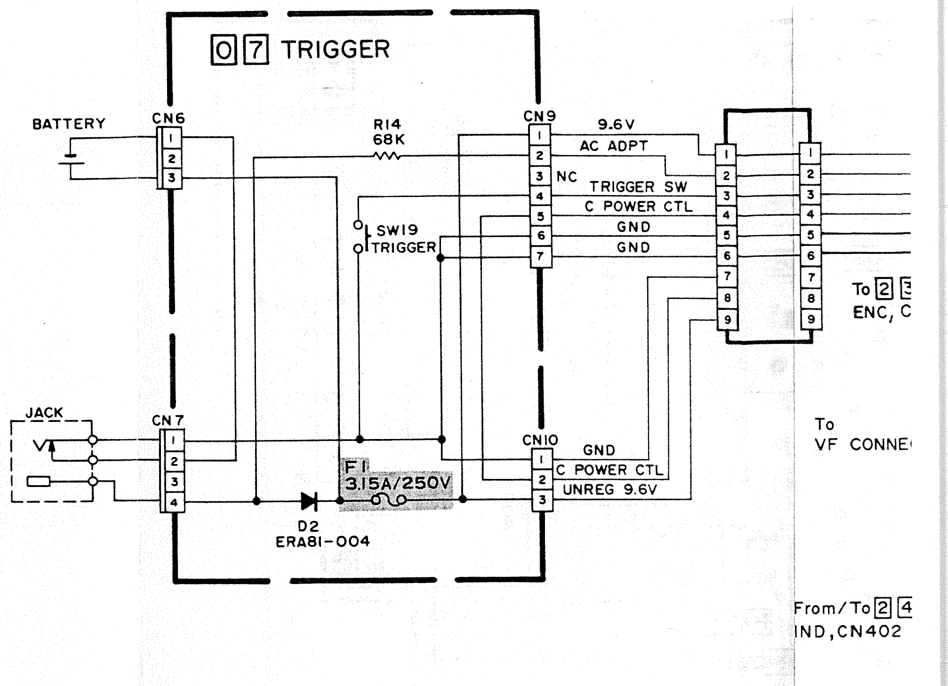

A
B
C
D
E
1
2
3
CN409
CN403
CN408
C413
R457
R456
IC404
R404
R403
R443
R425
R405
R406
Q403
C417
R474
Q404
C436
Q407
R433
R432
R436
R435
R428
Q408
Q412
R424
R422
Q410
R431
Q409
L406
C415
CN404
C432
R465
R466
R430
R467
R468
R470
R471
R469
CN401
C414
L405
R448
C422
IC405
C410
C423
L402
C409
IC402
C431
C402
CN402
R473
L403
D404
C408
D403
R409
R404
R406
R408
R461
C404
CN410
C403
L401
C401
R418
C411
C412
CN405
CN406
L404
CN407
IND PWB ASS'Y YB20057D-02-C
IND PWB YB20057-01-02

5.26 ELECTRICAL VIEWFINDER SCHEMATIC DIAGRAM



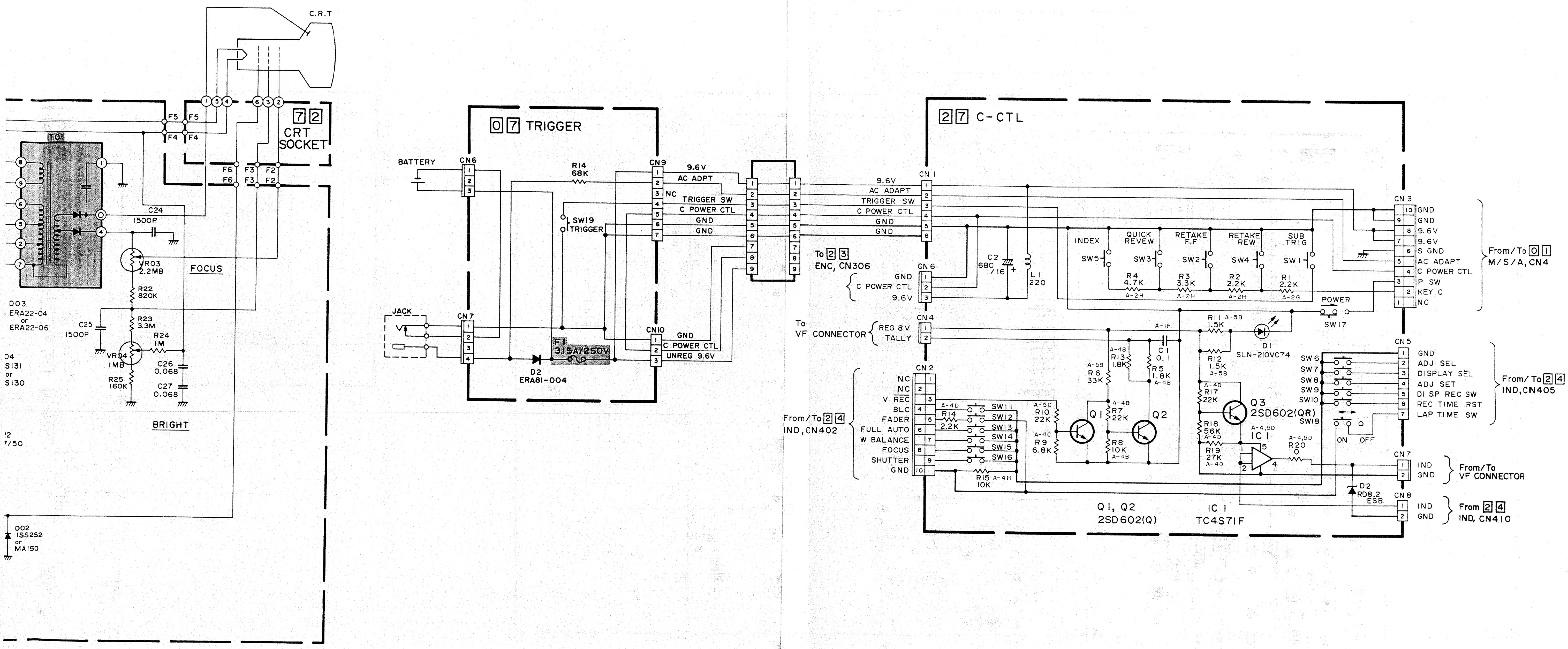
C.R.T
DEF YOKE
(DY V)
(DY H)
F9
F10
F7
F8
7 1 VF MAIN
R26 3.9K
C04 10/16
C20 47/10
R21 2.2K
L03
IC01 BA7125L
D6 MA4075-M
R05 330
HIGHT
R03 10
VR02 1K8
C06 33/10
C05 220/6.3
C28 0.01
R04 56K
R01 1.2K
C01 2200P
C02 10/16
C03 0.01
R02 47K or 43K or 51K
H OSC
VIDEO AMP
BLANK LOGIC
V OSC
DRIVE
V SYNC SEP
Vcc
PHASE DET
SYNC SEP
START
GND
TF01
C21
1500P/100 or 1800P/100 or 2200P/100
Q02
C19 10/16
D01 1SS133 or 1SS131
L04 330
C23 100/10
T01
D03 ERA22-04 or ERA22-06
D04 1SS131 or 1SS130
C22 4.7/50
C24 1500P
VR03 2.2MB
FOCUS
R22 820K
R23 3.3M
C25 1500P
R24 1M
VR04 1MB
C26 0.068
R25 160K
C27 0.068
BRIGHT
F5
F4
F6
F3
F2
7 2 CRT SOCKET
R07 82K
C08 0.022
R06 10K
C07 1/50
VR01 10KB
R08 6.8K
C09 100/10
C10 0.47/50
C11 0.1/50
C13 4700P
C14 0.68/35
C12 470P
R11 1K
R09 750
R12 1K
R10 1.5K
R13 1K
H. HOLD
C15 100/10
R27 18
L02 100
ICP01
ICP-N10
R18 5.1K
C17 1/50
Q01
R20 1M
D02 1SS252 or MA150
R15 2.2K
R16 470
R14 1.8K
C16 10/16
R17 10K
R19 1.2K
C18 200P
Q02 2SD774
Q01 2SD814
V3
V1
V5
V4
V2
J1
EVF IND
GND
8V
VIDEO GND
CN1
VIDEO IN
TALLY LED CTL IN
7 3 TALLY LED
D05 LN28CAL

5.27 CAMERA CTL AND TRIGGER SCHEMATI(



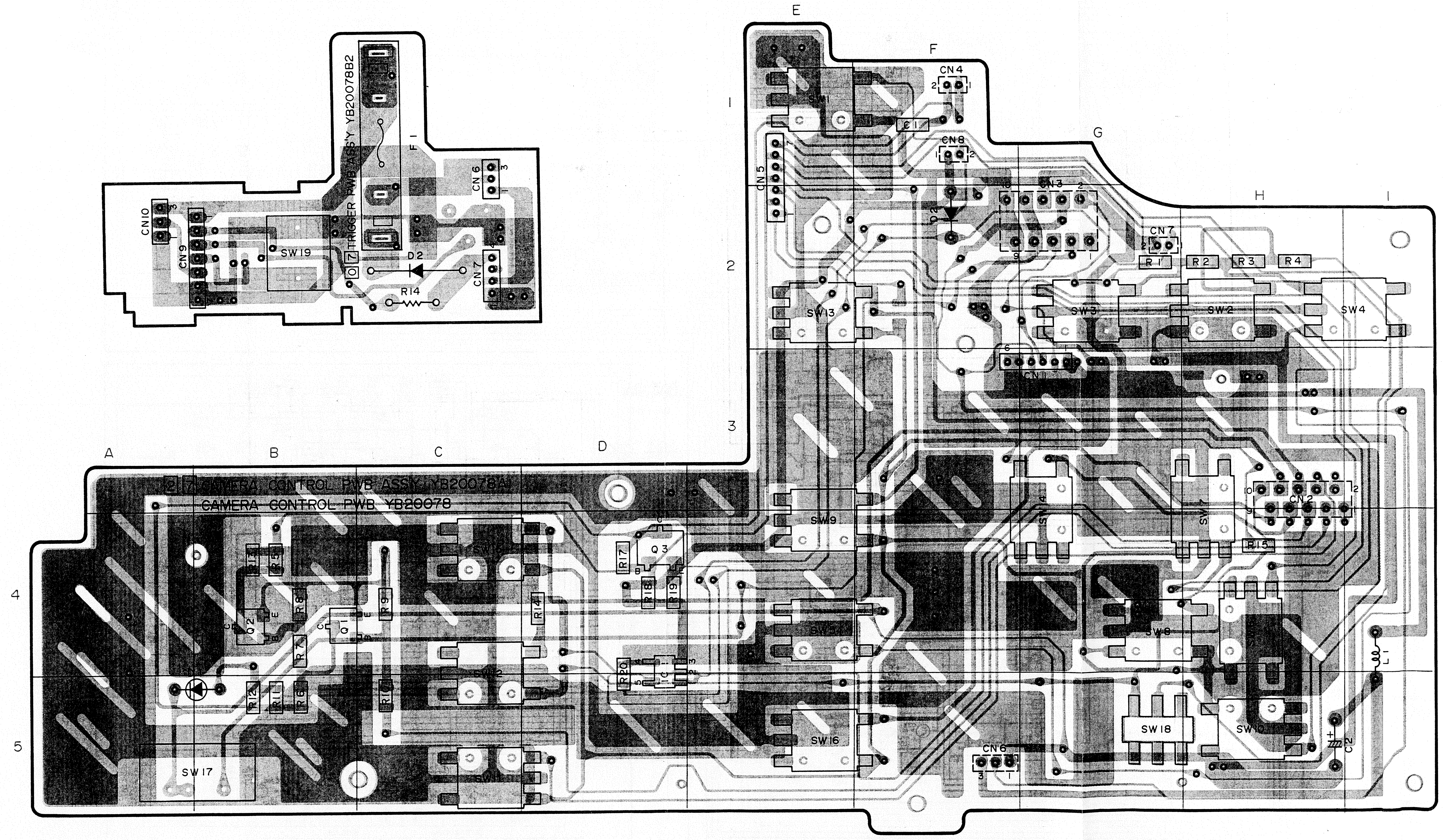
0 7 TRIGGER
BATTERY
CN6
R14 68K
CN9
9.6V
AC ADPT
NC
TRIGGER SW
C POWER CTL
GND
GND
SW19 TRIGGER
To 2 3 ENC, C
JACK
CN7
CN10
GND
C POWER CTL
UNREG 9.6V
F1 3.15A/250V
D2 ERA81-004
To VF CONNE
From/To 2 4 IND, CN402

5.27 CAMERA CTL AND TRIGGER SCHEMATIC DIAGRAM


C.R.T
F5
F4
F6
F3
F2
7 2 CRT SOCKET
T01
C24
1500P
VR03
2.2MB
FOCUS
R22
820K
D03
ERA22-04
or
ERA22-06
C25
1500P
R23
3.3M
R24
1M
VR04
1MB
R25
160K
C26
0.068
C27
0.068
04
S131
or
S130
BRIGHT
2
7/50
D02
1SS252
or
MA150
0 7 TRIGGER
BATTERY
CN6
R14
68K
CN9
9.6V
AC ADPT
NC
TRIGGER SW
C POWER CTL
GND
GND
SW19
TRIGGER
JACK
CN7
D2
ERA81-004
F1
3.15A/250V
CN10
GND
C POWER CTL
UNREG 9.6V
2 7 C-CTL
CN1
9.6V
AC ADAPT
TRIGGER SW
C POWER CTL
GND
GND
To 2 3
ENC, CN306
CN6
GND
C POWER CTL
9.6V
C2
680
/16
L1
220
INDEX
QUICK REVEW
RETAKE F.F
RETAKE REW
SUB TRIG
SW5
SW3
SW2
SW4
SW1
R4
4.7K
A-2H
R3
3.3K
A-2H
R2
2.2K
A-2H
R1
2.2K
A-2G
POWER
SW17
CN3
GND
GND
9.6V
9.6V
S GND
AC ADAPT
C POWER CTL
P SW
KEY C
NC
From/To 0 1
M/S/A, CN4
To
VF CONNECTOR
CN4
REG 8V
TALLY
A-1F
R11 A-5B
1.5K
D1
SLN-210VC74
C1
0.1
A-4B
R13
1.8K
R5
1.8K
A-4B
A-5B
R6
33K
R12
1.5K
A-5B
CN2
NC
NC
V REC
BLC
FADER
FULL AUTO
W BALANCE
FOCUS
SHUTTER
GND
From/To 2 4
IND, CN402
A-4D
R14
2.2K
SW11
SW12
SW13
SW14
SW15
SW16
R15 A-4H
10K
A-5C
R10
22K
A-4C
R9
6.8K
Q1
A-4B
R7
22K
Q2
R8
10K
A-4B
A-4D
R17
22K
Q3
2SD602(QR)
R18
56K
A-4D
R19
27K
A-4D
A-4,5D
IC1
A-4,5D
R20
0
SW6
SW7
SW8
SW9
SW10
SW18
ON
OFF
CN5
GND
ADJ SEL
DISPLAY SEL
ADJ SET
DI SP REC SW
REC TIME RST
LAP TIME SW
From/To 2 4
IND, CN405
CN7
IND
GND
From/To
VF CONNECTOR
D2
RD8.2
ESB
CN8
IND
GND
From 2 4
IND, CN410
Q1, Q2
2SD602(Q)
IC1
TC4S71F

5.28 CAMERA CTL AND TRIGGER CIRCUIT BOARD

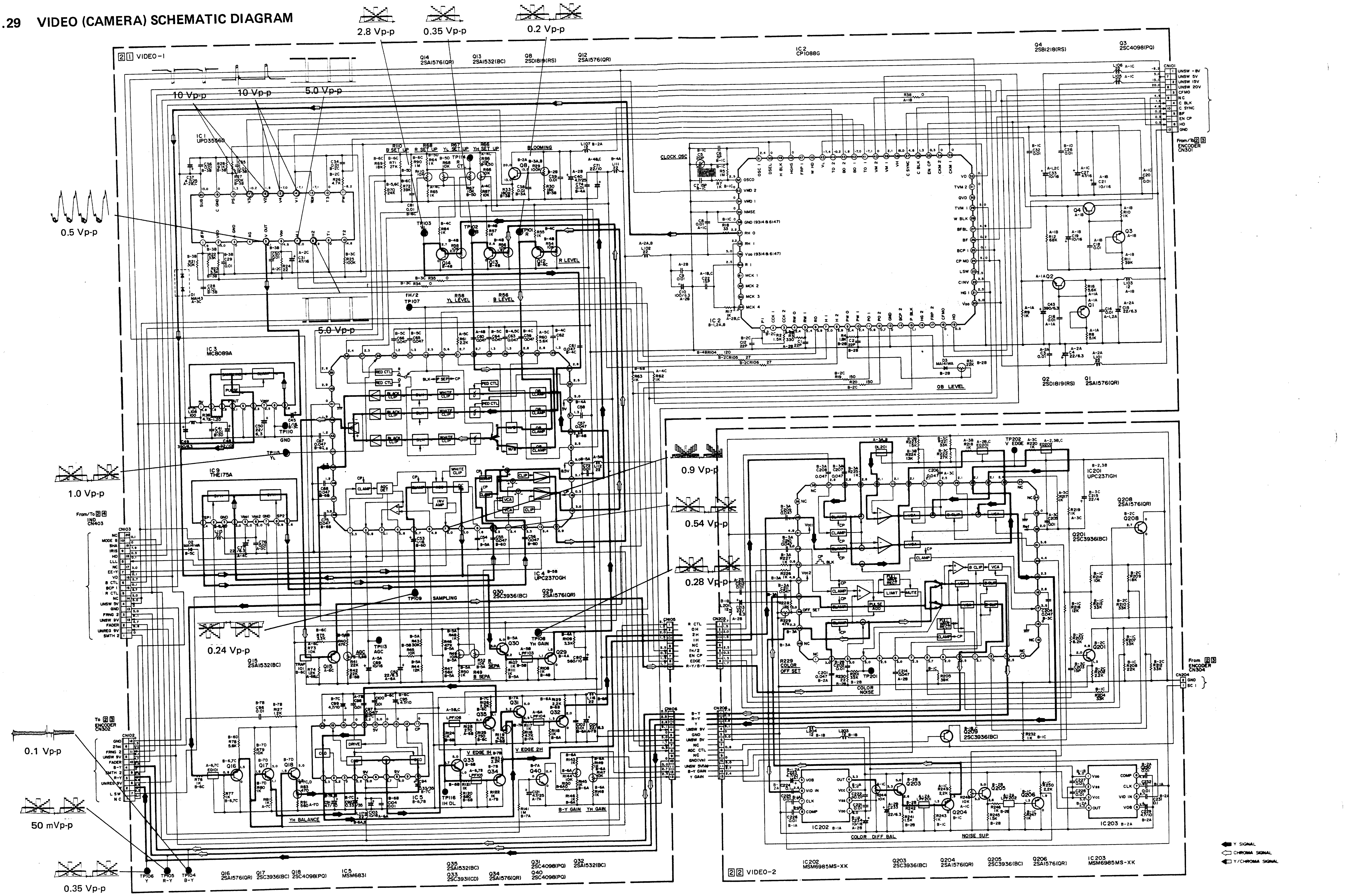
– TRIGGER –


TRIGGER PWB ASS'Y YB20078B2
F1
CN6
CN10
CN9
SW19
D2
R14
CN7

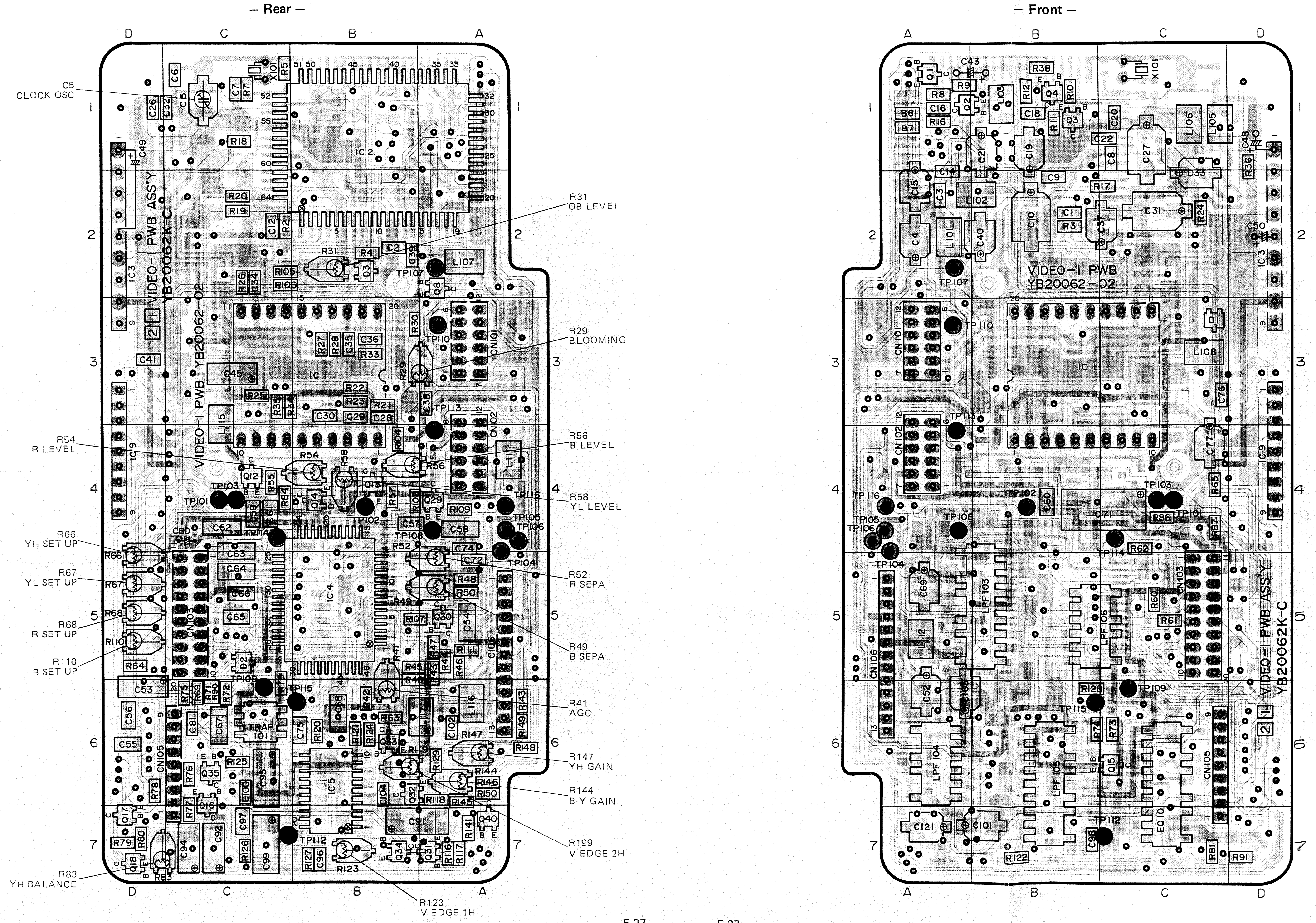
– CAMERA CTL –

E
F
G
H
I
1
2
3
4
5
A
B
C
D
CN4
SW11
C1
CN8
CN5
D3
CN3
CN7
R1
R2
R3
R4
SW13
SW3
SW2
SW4
CN1
SW9
SW7
CN2
R15
CAMERA CONTROL PWB ASS'Y YB20078A1
CAMERA CONTROL PWB YB20078
Q3
R17
R18
R19
R5
Q2
R8
Q1
R9
R7
R14
R12
R11
R6
R10
SW17
R20
IC1
SW16
CN6
SW18
SW8
L1
C2

5.29 VIDEO (CAMERA) SCHEMATIC DIAGRAM


2.8 Vp-p
0.35 Vp-p
0.2 Vp-p
2-1 VIDEO-1
10 Vp-p
10 Vp-p
5.0 Vp-p
5.0 Vp-p
0.5 Vp-p
1.0 Vp-p
0.24 Vp-p
0.1 Vp-p
50 mVp-p
0.35 Vp-p
0.9 Vp-p
0.54 Vp-p
0.28 Vp-p
IC1 UPD3556D
IC2 CP1088G
IC3 MC8089A
IC9 THE175A
IC4 UPC2370GH
IC5 MSM6831
IC201 UPC2371GH
IC202 MSM6985MS-XK
IC203 MSM6985MS-XK
Q14 2SA1576(QR)
Q13 2SA1532(BC)
Q8 2SD1819(RS)
Q12 2SA1576(QR)
Q4 2SB1218(RS)
Q3 2SC4098(PQ)
Q2 2SD1819(RS)
Q1 2SA1576(QR)
Q15 2SA1532(BC)
Q30 2SC3936(BC)
Q29 2SA1576(QR)
Q16 2SA1576(QR)
Q17 2SC3936(BC)
Q18 2SC4098(PQ)
Q35 2SA1532(BC)
Q33 2SC3931(CD)
Q34 2SA1576(QR)
Q31 2SC4098(PQ)
Q40 2SC4098(PQ)
Q32 2SA1532(BC)
Q208 2SA1576(QR)
Q201 2SC3936(BC)
Q209 2SC3936(BC)
Q203 2SC3936(BC)
Q204 2SA1576(QR)
Q205 2SC3936(BC)
Q206 2SA1576(QR)
B SET UP
R SET UP
YL SET UP
YH SET UP
BLOOMING
CLOCK OSC
YL LEVEL
B LEVEL
R LEVEL
OB LEVEL
fH/2 TP107
SAMPLING
AGC
YH GAIN
R SEPA
B SEPA
V EDGE 1H
V EDGE 2H
IH DL
YH BALANCE
B-Y GAIN
YH GAIN
COLOR OFF SET
COLOR NOISE
COLOR DIFF BAL
NOISE SUP
V EDGE
TP101
TP102
TP103
TP104 B-Y
TP105 R-Y
TP106 Y
TP108
TP109
TP110
TP113
TP115 YL
TP116
TP201
TP202
CN101
UNSW -8V
UNSW 5V
UNSW 15V
UNSW 20V
CFMO
NC
C BLK
C SYNC
BF
EN CP
HD
GND
From/To 2-3 ENCODER CN301
From/To 2-4 IND CN403
CN103
MODE 3
SHA
IRIS
HD
LLL
EE-Y
VD
B CTL
BCP 1
R CTL
UNSW 5V
FRNG 2
UNSW 9V
FADER
UNREG 9V
SMTH 2
To 2-3 ENCODER CN302
CN102
2fsc
LSW
CN105
CN205
R CTL
OH
2H
1H
fH/2
EN CP
EDGE
R-Y/B-Y
CN106
CN206
B-Y
R-Y
Y
AGC CTL
GND(VH)
UNSW 9V(A)
B-Y GAIN
Y GAIN
From 2-3 ENCODER CN304
CN204
GND
SC I
2-2 VIDEO-2
Y SIGNAL
CHROMA SIGNAL
Y/CHROMA SIGNAL

5.30 VIDEO-1 CIRCUIT BOARD



— Rear —

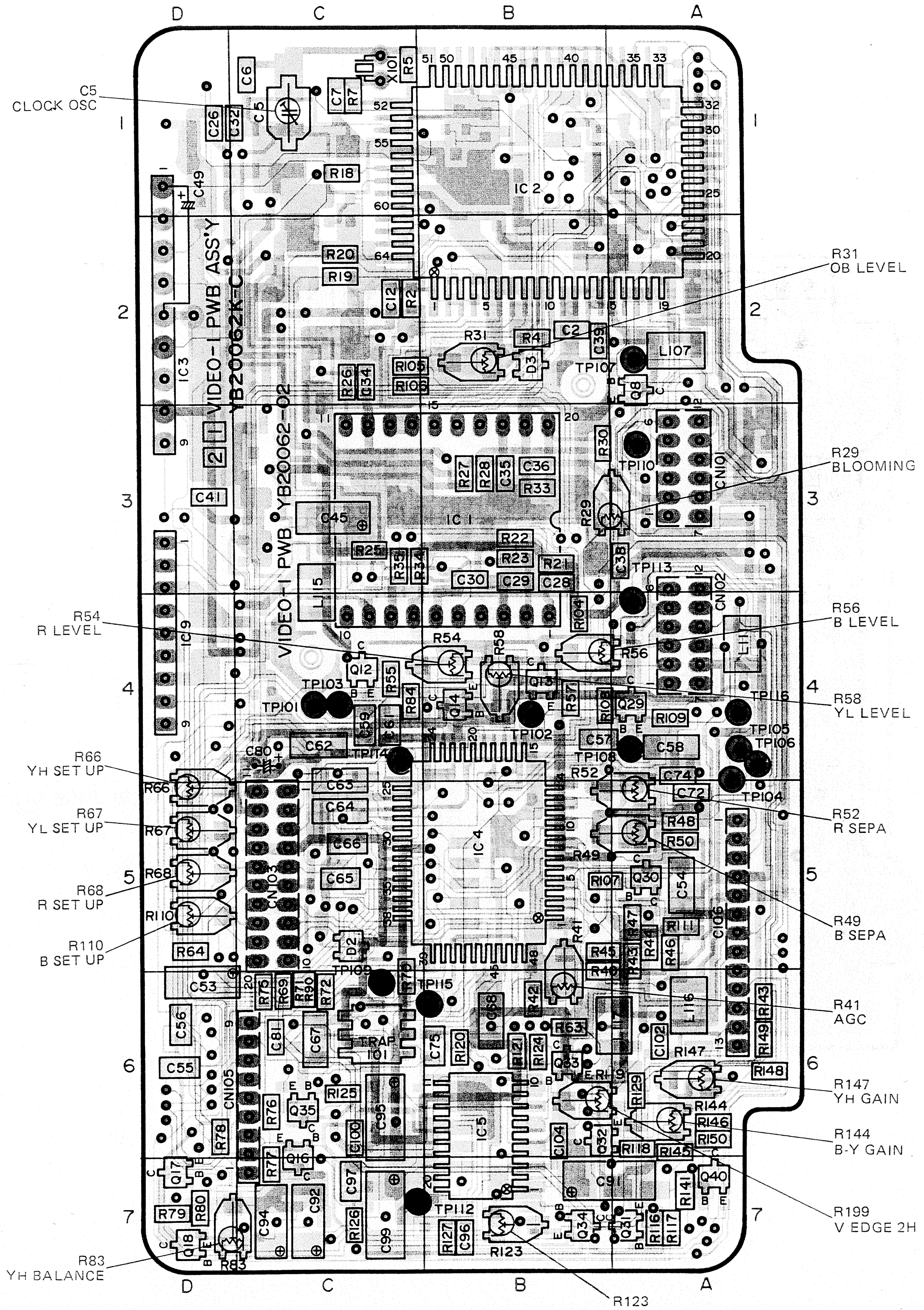
— Front —

C5
CLOCK OSC
R31
OB LEVEL
R29
BLOOMING
R54
R LEVEL
R56
B LEVEL
R58
YL LEVEL
R66
YH SET UP
R67
YL SET UP
R68
R SET UP
R110
B SET UP
R52
R SEPA
R49
B SEPA
R41
AGC
R147
YH GAIN
R144
B-Y GAIN
R199
V EDGE 2H
R83
YH BALANCE
R123
V EDGE 1H
VIDEO-1 PWB ASS'Y
YB20062K-C
VIDEO-1 PWB
YB20062-02
A
B
C
D
1
2
3
4
5
6
7

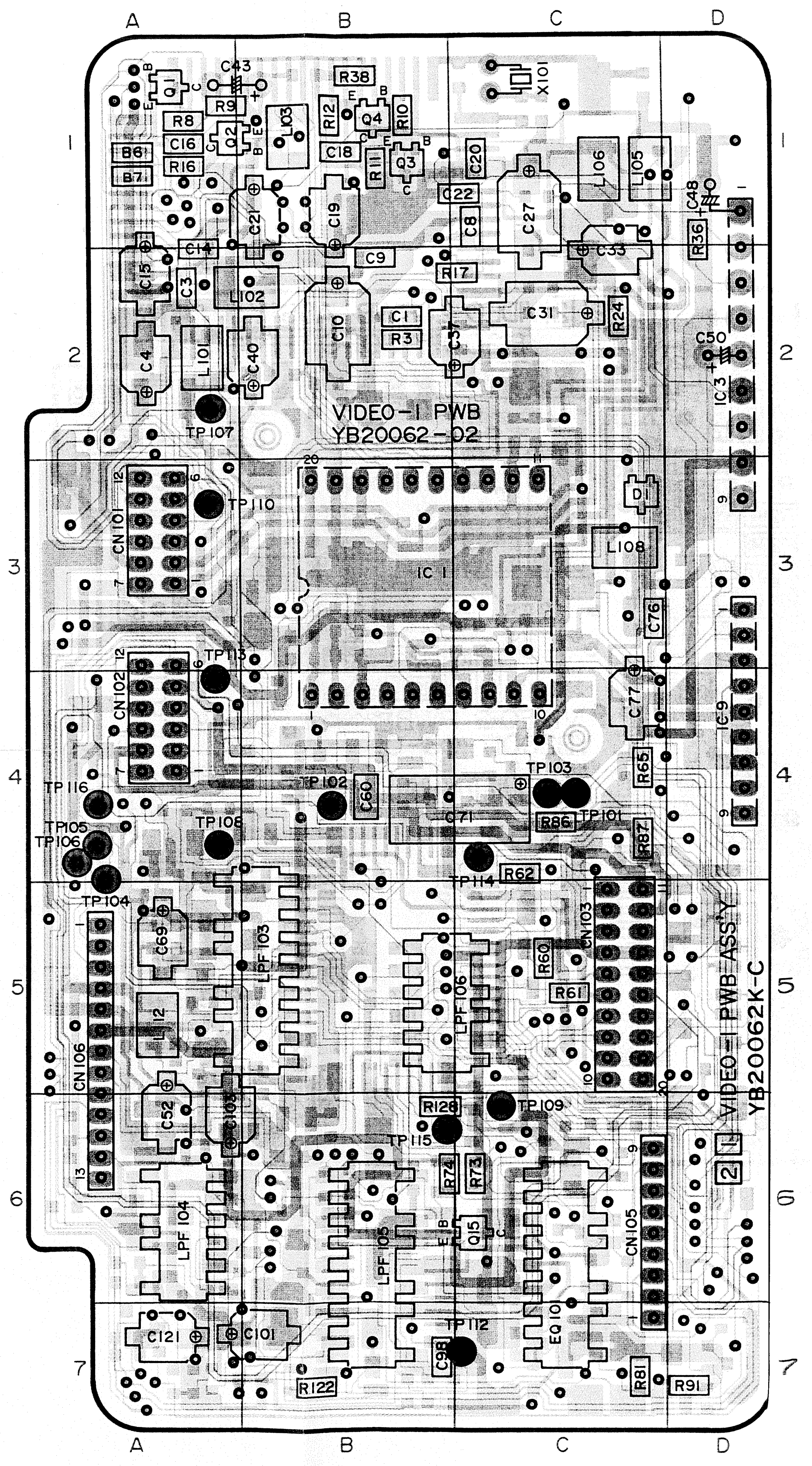
5-27

5.30 VIDEO-1 CIRCUIT BOARD

– Rear –

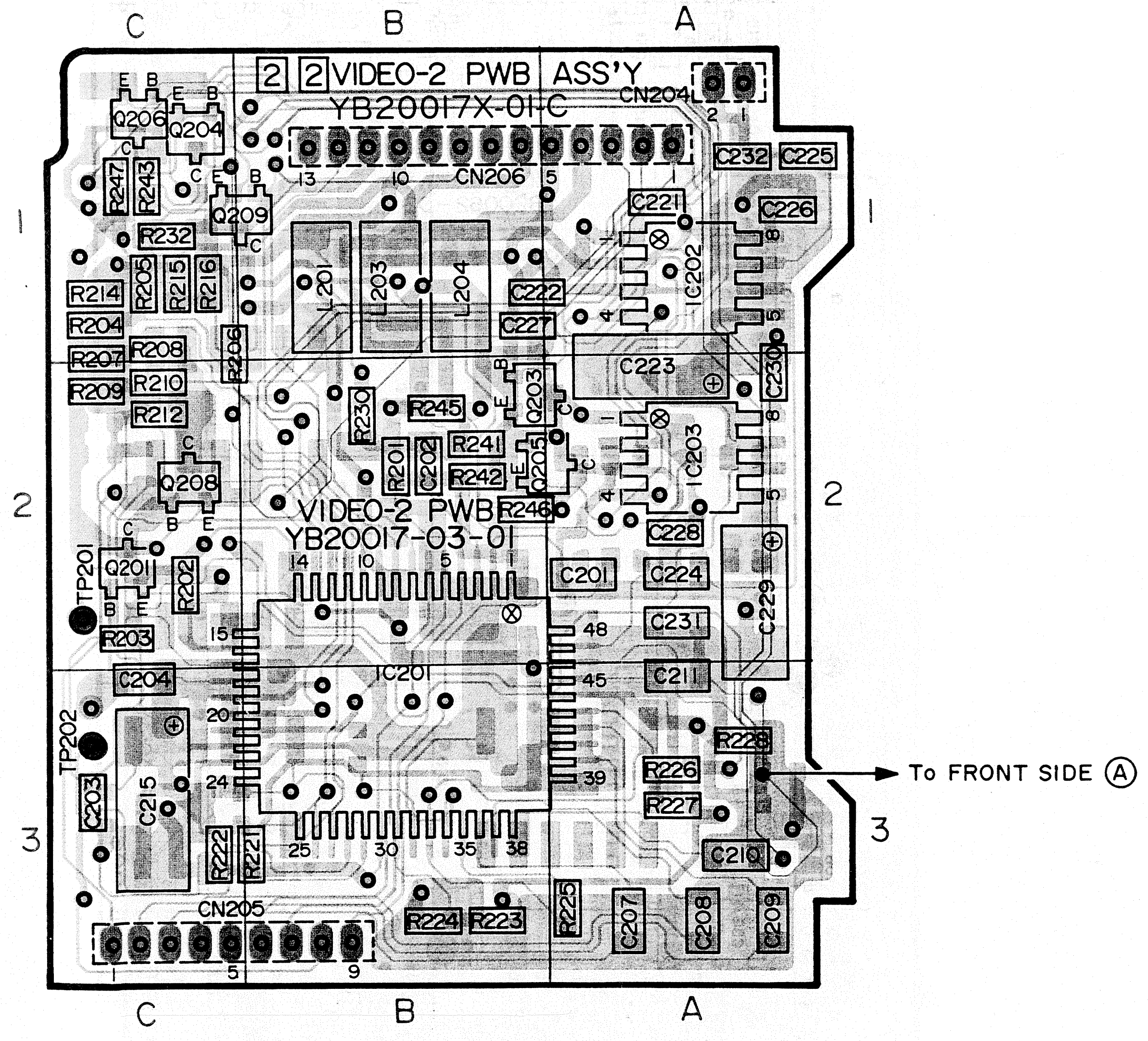

D
C
B
A
1
2
3
4
5
6
7
C5
CLOCK OSC
R31
OB LEVEL
R29
BLOOMING
R56
B LEVEL
R58
YL LEVEL
R52
R SEPA
R49
B SEPA
R41
AGC
R147
YH GAIN
R144
B-Y GAIN
R199
V EDGE 2H
R123
V EDGE 1H
R54
R LEVEL
R66
YH SET UP
R67
YL SET UP
R68
R SET UP
R110
B SET UP
R83
YH BALANCE
VIDEO-1 PWB ASS'Y
YB20062K-C
VIDEO-1 PWB
YB20062-02
IC 1
IC 2
IC 3
IC 4
IC 5
IC 9
CN101
CN102
CN103
CN105
CN106
TP101
TP102
TP103
TP104
TP105
TP106
TP107
TP108
TP109
TP110
TP112
TP113
TP114
TP115
TP116
TRAP 101

– Front –


A
B
C
D
1
2
3
4
5
6
7
VIDEO-1 PWB
YB20062-02
VIDEO-1 PWB ASS'Y
YB20062K-C
IC 1
IC 3
IC 9
X101
CN101
CN102
CN103
CN105
CN106
LPF 103
LPF 104
LPF 105
LPF 106
EQ 101
TP101
TP102
TP103
TP104
TP105
TP106
TP107
TP108
TP109
TP110
TP112
TP113
TP114
TP115
TP116

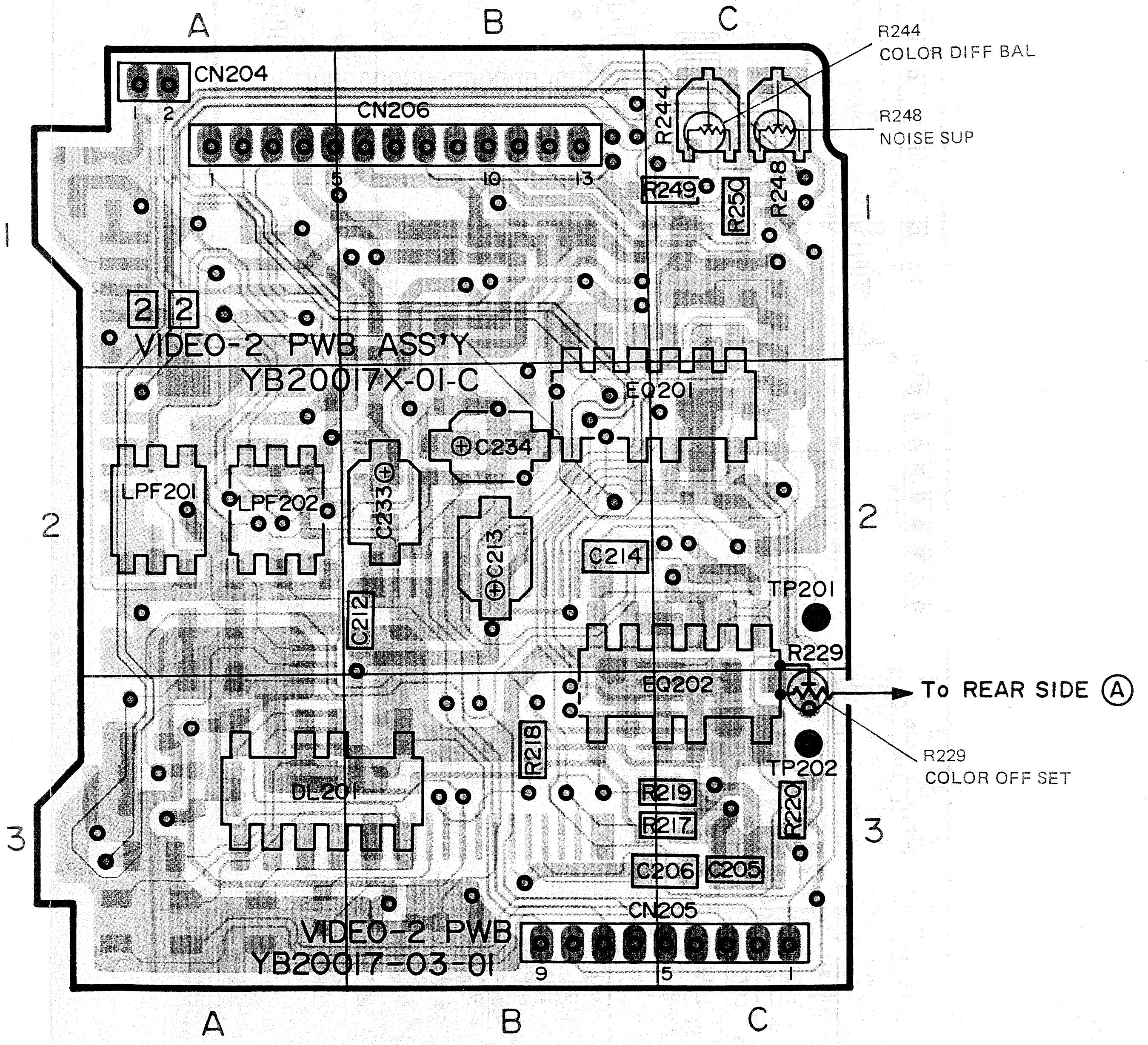
5.31 VIDEO-2 CIRCUIT BOARD

– Rear –



C
B
A
1
2
3
2 VIDEO-2 PWB ASS'Y
YB20017X-01-C
CN204
CN206
CN205
VIDEO-2 PWB
YB20017-03-01
Q201
Q203
Q204
Q205
Q206
Q208
Q209
IC201
IC202
IC203
L201
L203
L204
TP201
TP202
R201
R202
R203
R204
R205
R206
R207
R208
R209
R210
R212
R214
R215
R216
R222
R223
R224
R225
R226
R227
R228
R230
R232
R241
R242
R243
R245
R246
R247
C201
C202
C204
C207
C208
C209
C210
C211
C215
C221
C222
C223
C224
C225
C226
C227
C228
C229
C230
C231
C232
To FRONT SIDE Ⓐ

– Front –



A
B
C
1
2
3
CN204
CN206
CN205
2 VIDEO-2 PWB ASS'Y
YB20017X-01-C
VIDEO-2 PWB
YB20017-03-01
EQ201
EQ202
DL201
LPF201
LPF202
C205
C206
C212
C213
C214
C233
C234
R217
R218
R219
R220
R229
R244
R248
R249
R250
TP201
TP202
R244
COLOR DIFF BAL
R248
NOISE SUP
R229
COLOR OFF SET
To REAR SIDE Ⓐ

SECTION 6
EXPLODED VIEWS AND PARTS LIST

SAFETY PRECAUTION

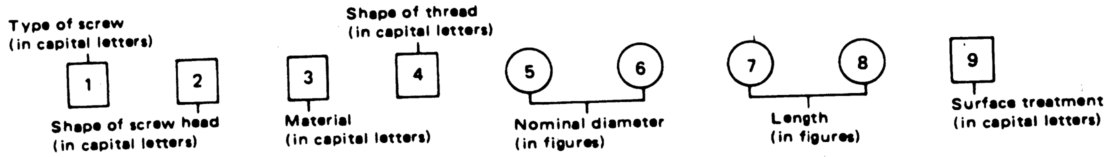
Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

NOTE :
[M] indicates mechanical symbol number.

6.1 STANDARD PART NUMBER CODING

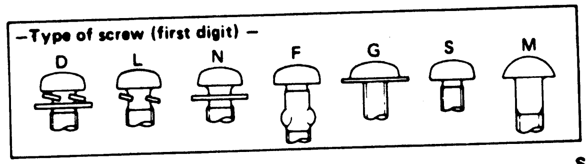
6.1.1 Screw coding

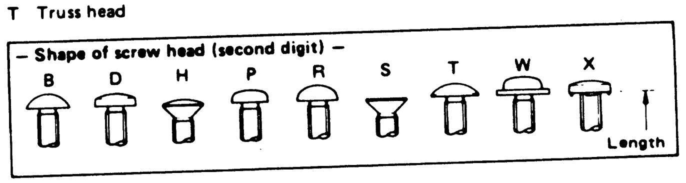
Standard screw part numbers are as follows.


Type of screw
(in capital letters)
Shape of thread
(in capital letters)
1
2
3
4
5
6
7
8
9
Shape of screw head
(in capital letters)
Material
(in capital letters)
Nominal diameter
(in figures)
Length
(in figures)
Surface treatment
(in capital letters)

Type of screw (first digit)
- S Normal screws
- D Assembled machine screws (with plain and spring washers)
- L 〃 (with spring washer)
- N 〃 (with plain washer)
- F Feather screws
- G Washer head tapping screws
- M Wood screws

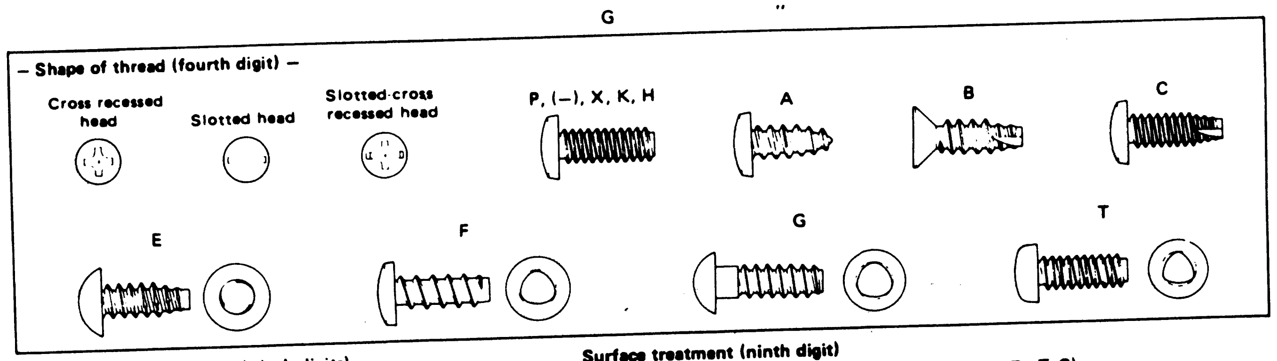
Shape of screw head (second digit)
- B Brazier head
- D Binding head
- H Oval countersunk head
- P Pan head
- R Round head
- S Flat head
- T Truss head
- W Washer head (machine screws)
- X Toothed head


–Type of screw (first digit) –
D
L
N
F
G
S
M


– Shape of screw head (second digit) –
B
D
H
P
R
S
T
W
X
Length

Material (third digit)
- S Steel
- E Stainless steel
- C Cast iron
- U Copper
- B Brass
- P Phosphor bronze
- N Nickel silver
- Y Cast brass
- A Aluminum
- Z Zinc alloy
- K Polycarbonate

Shape of thread (fourth digit)
- P Cross recessed head screws
- (–) Slotted head machine screws
- X Slotted-cross recessed head machine screws
- K Cross recessed head machine screws for precision equipment (type 1)
- H 〃 (type 3)
- A Cross recessed head tapping screws (type 1)
- B 〃 (type 2)
- C 〃 (type 3)
- E Cross recessed head special tapping screws (brand : evertight)
- F 〃 (brand : P-tight)
- T 〃 (brand : taptight)
- G 〃

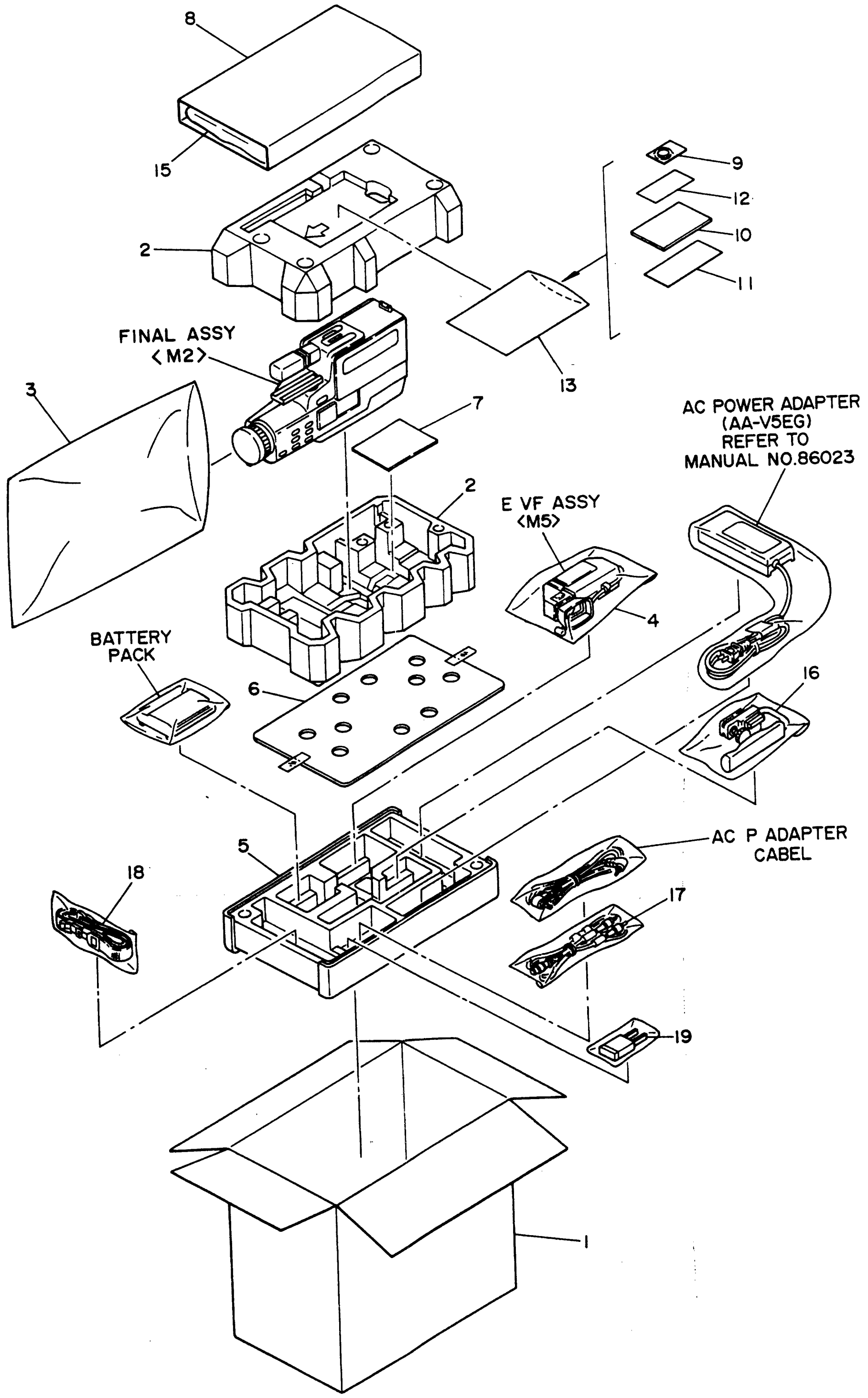

– Shape of thread (fourth digit) –
Cross recessed head
Slotted head
Slotted-cross recessed head
P, (–), X, K, H
A
B
C
E
F
G
T

Nominal diameter (fifth and sixth digits)
The fifth and sixth digits indicate a nominal diameter or dimension. If the dimension exceeds 10 mm, three digits are used. The number indicates a nominal diameter or dimension, given in millimeters, multiplied by ten.

Length (seventh and eighth digits)
The seventh and eighth digits indicate length in millimeters. The preceding figure is zero when the dimension is smaller than 10 mm. For machine screws used in precision equipment whose length is given in units of 0.1 mm, the number indicates ten times the size of their length.

Surface treatment (ninth digit)
- Z Dichromate treatment after galvanizing (MFZn II-C)
- N Nickel plating (MFNi II, MFNi I)
- R Chromium plating (MBCr II, MBCr I)
- G Silver plating (SP4)
- B Black coating after plating
- F Blackening of iron (FB)
- M Blackening after galvanizing
- K Pickling of brass (PF2)
- P Phosphate treatment
- W Uni-chrome plating
- L Coated with transparent paint
- A Colored red after galvanizing (MFZn II-C)
- C Colored blue after galvanizing (MFZn II-C)
- T Colored green after galvanizing (MFZn II-C)
- V Colored purple after galvanizing (MFZn II-C)

6.2 PACKING ASSEMBLY <M1>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AC P ADAPTER
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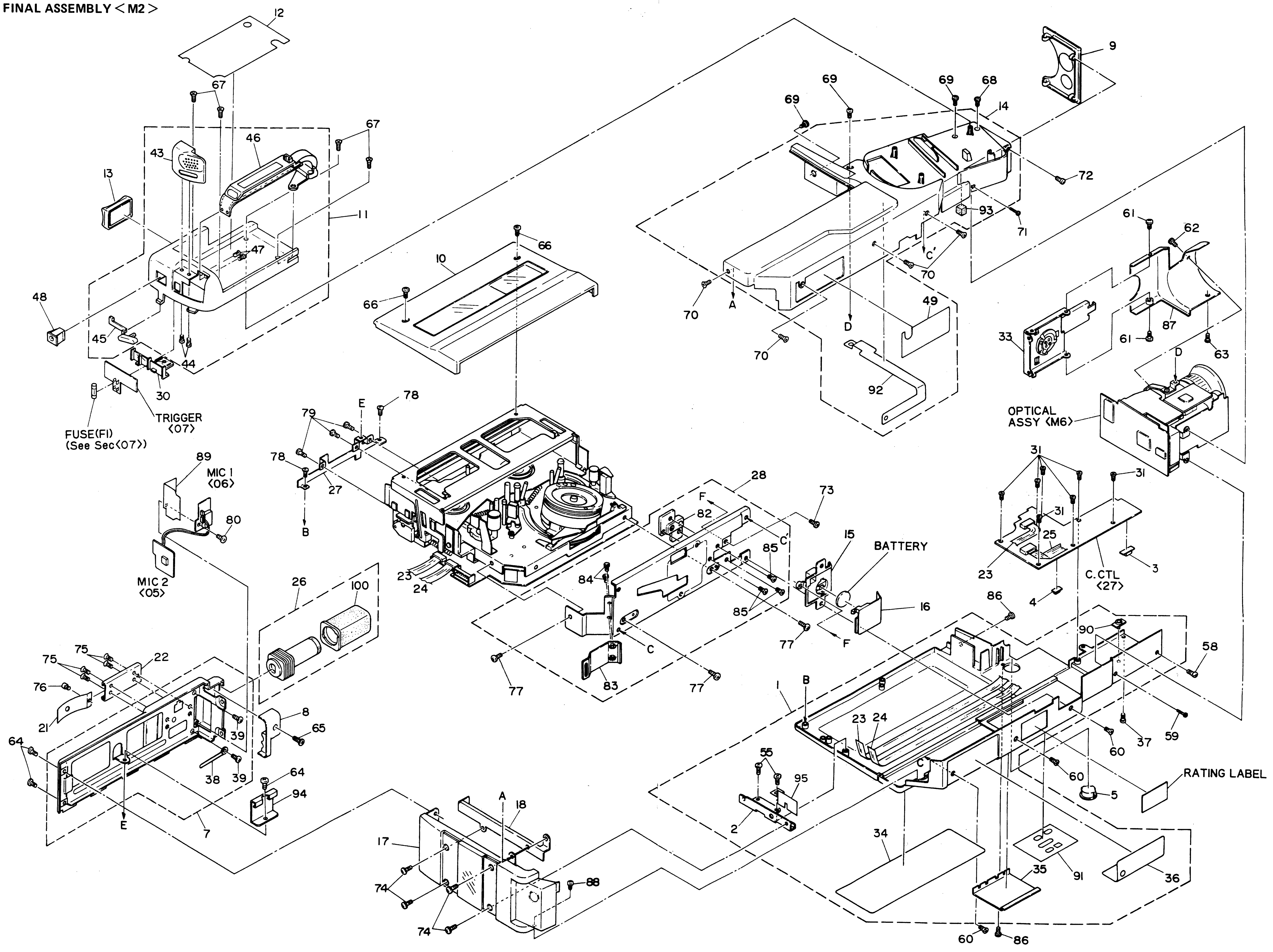
2. PACKING ASSEMBLY <M1>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	1	YQ30319	PACKING CASE
	2	YQ30275A	CUSHION ASSY
	3	YQM30021-8	POLY BAG
	4	YQM30021-6	POLY BAG
	5	YQ20120	ACC TRAY
	6	YQ30224	ACCESSORY TRAY COVER
	7	YQ40832	SPACER
	8	YU40928	SPACER
⚠	9	YU40547	BATTERY
⚠	10	YU30052-48-1	INSTRUCTIONS
	11	PU59932	INST.SHEET
	12	TCN-3379	TAPE CATALOGUE
	13	QPGA025-03505	POLY BAG
	15	YQ20170A	SOFT CASE
⚠	16	YU40168-1-1	CARRIYING HANDL
	17	YQ10058B	A/V CABLE ASS'Y
⚠	18	YU30121-2	SHOULDER BELT
⚠	19	QMC0271-001	CONVERSION PLUG

6.3 FINAL ASSEMBLY < M2 >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OPTICAL
ASSY <M6>
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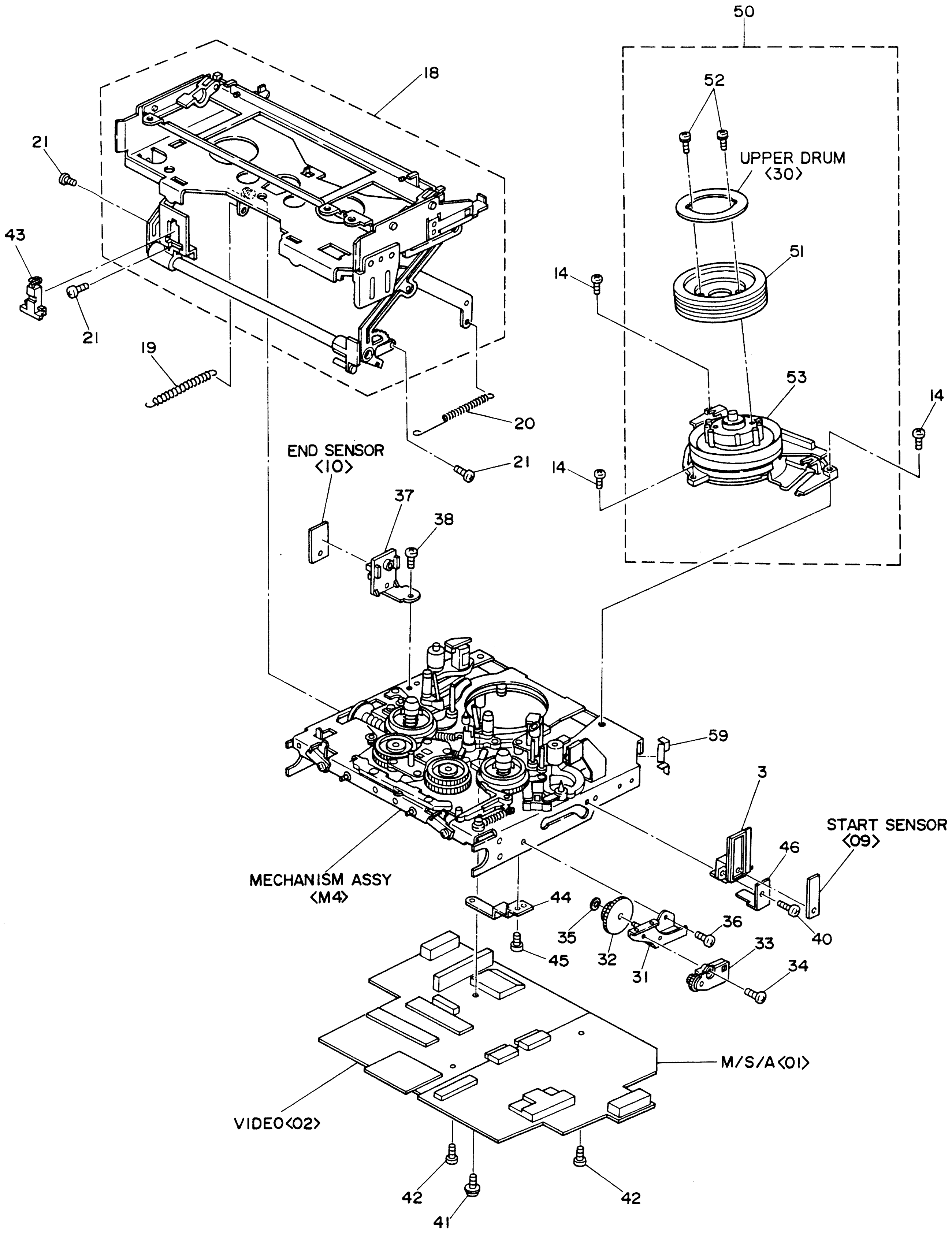
3. FINAL ASSEMBLY <M2>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
⚠	1	YQ10079H	LOWER CASE ASSY, INCL. 2,34–36,55,90,91
	2	YQ40595-1-4	OPERAITION UNIT BKT(1)
	3	YQ40588	KNOB(POWER)
	4	YQ40611	KNOB(REC TIME)
	5	PU59008	VF SOCKET ASSEMBLY
⚠	7	YQ20112H	TOP COVER ASSY,INCL.38,39
	8	YQ40607	MIC COVER
⚠	9	YQ30213G	FRONT PANEL ASSY
	10	YQ20129H-3	CASSETTE COVER ASSY
	11	YQ10077H	BATTERY BASE ASSY,INCL.43-47
⚠	12	YU30176	BATTERY BASE SHEET
	13	YU40204-3	ZOOM SWITCH
⚠	14	YQ10078H	UPPER CASE ASSY,INCL.49,92,93
	15	YQ30210A-1	BACK-UP BATTERY HOLDER ASSY
⚠	16	YQ30226	BACK-UP BATTERY COVER
⚠	17	YQ20110-8-8	OPERATION UNIT
	18	YQ40596-1-3	OPERAITION UNIT BKT(2)
	21	PQ42731-1-2	SHOE
	22	PQ42722	SHOE CLIP
	23	YU40543	FLAT WIRE(1)
	24	YU40544	FLAT WIRE(2)
		OR YU40544-3	FLAT WIRE(2)
		OR YU40544-2	FLAT WIRE(2)
	25	YU40545	FLAT WIRE(3)
	26	YU40630	MICROPHONE, INCL. 100
	27	YQ30205-1-4	MAIN DECK BKT
	28	YQ20130A-3	BASE ASSY, INCL. 82–85
	30	YQ30090-1-1	TRIGGER BOARD STOPPER
	31	SDSF2005Z	TAPPING SCREW,X7
	33	YQ30209A-2	VF HOLDER ASSEMBLY
	34	YQ30200	FACE PAD
	35	YQ30225-6	CURSOR
	36	YQ40594-1-2	SHOLDER PAD(L)
	37	SDSF2606D	SCREW
	38	PU49485-3	WIRE CLAMP
	39	SDSF2605D	SCREW,X2
	43	YQ30098-4-6	FINGER REST
	44	SDSF2006Z	TAPPING SCREW,X2
	45	YQ30212	BUTTON(TRIGGER)
	46	YQ20111G	GRIP BELT ASSY
	47	SSSP2006D	SCREW,X2
	48	PU59862-1-1	DC JACK
	49	YQ40593-1-1	SHOLDER PAD(U)
	55	SDSF2606Z	TAPPING SCREW,X2
	58	YQM30032-9	SPECIAL SCREW
	59	YQM30032-3-2	SPECIAL SCREW
	60	SSSP2606D	SCREW,X3
	61	SDSP2606D	SCREW,X2
	62	YQM30032-3-2	SPECIAL SCREW
	63	YQM30032-9	SPECIAL SCREW
	64	SDSP2606D	SCREW,X3
	65	SDSF2606D	SCREW
	66	SDSP2606D	SCREW,X2
	67	SSSF2612D	SCREW,X4
	68	SSSF2612D	SCREW
	69	SDSP2606D	SCREW,X3
	70	SSSP2606D	SCREW,X4
	71	YQM30032-3-2	SPECIAL SCREW
	72	YQM30032-9	SPECIAL SCREW
	73	YQM30032-9	SCREW
	74	SDSP2606D	SCREW,X4
	75	SSSP2606D	SCREW,X4
	76	PU53946-2-1	SHOE SCREW
	77	SDST2605Z	SCREW,X3
	78	SDSF2606Z	TAPPING SCREW,X2
	79	SDST2605Z	SCREW,X3
	80	SDSF2606Z	TAPPING SCREW
	82	YQ30253A-1	BASE BLOCK
	83	YQ40701	SHOULDER HOOK 2
	84	SDSP2606Z	SCREW,X2
	85	YQM30032-9	SCREW,X3
	86	SDSP2606D	SCREW,X2
⚠	87	YQ20104-7	FRONT COVER
	88	SDSF2606Z	TAPPING SCREW
	89	YQ40700-1-1	PLATE
	90	YQ40827	INSULATOR
	91	YQ40609-7	OPERAITION SHEET
	92	YQ40726	SHIELD PLATE
	93	YQM30029-10	SPACER
	94	YQ40806-1-1	GUIDE BRACKET
	95	YQ40827	INSULATOR
	100	YU40630-001	WIND SCREEN

6.4 CHASSIS ASSEMBLY < M3 >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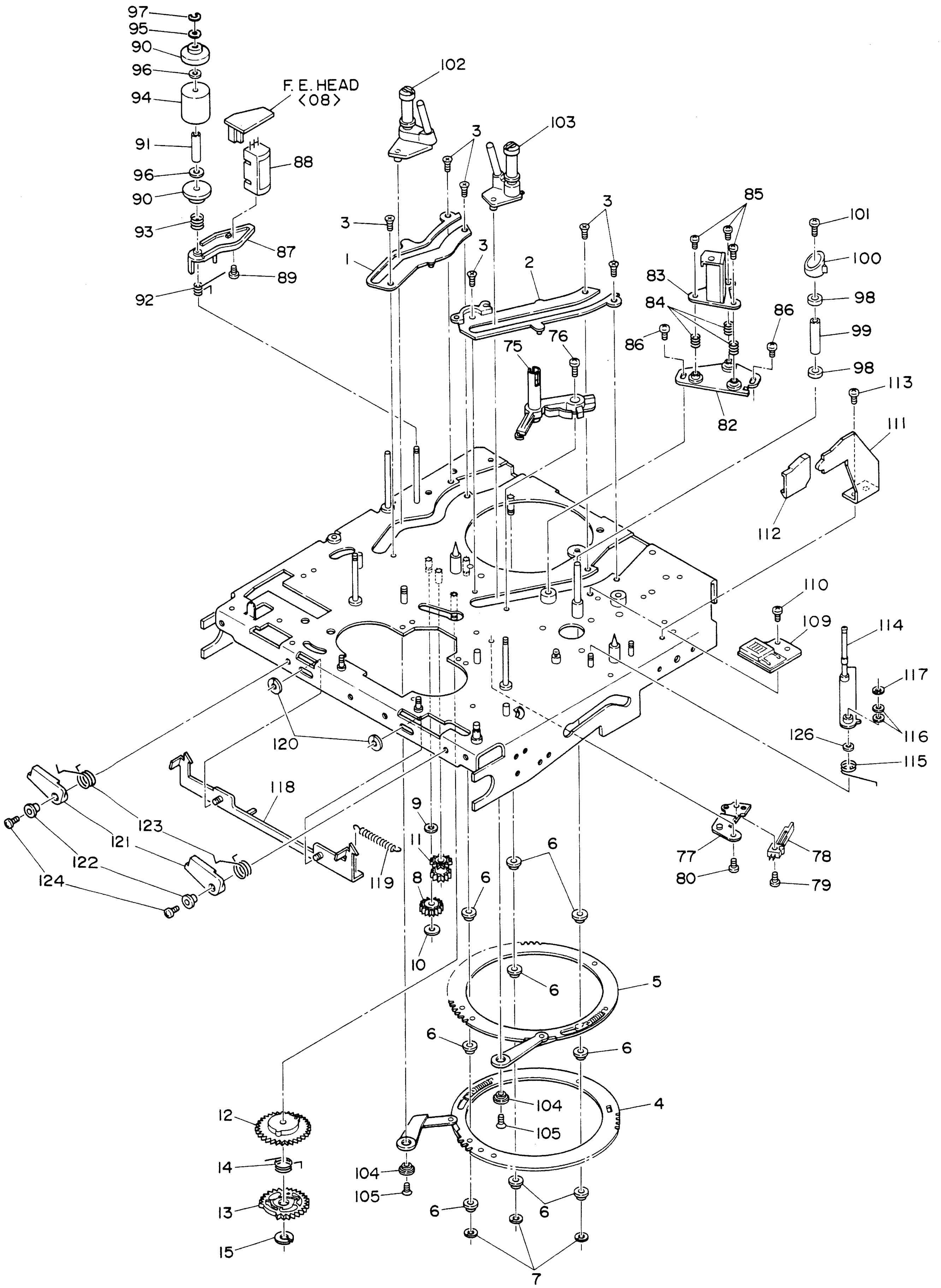
4. CHASSIS ASSEMBLY <M3>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	3	YQ30217-1-2	START SENSOR BRACKET
	14	SDSP2606Z	SCREW,X3
	18	YS30113A	CASS.HOUSING ASSY
	19	YQM30001-23	TENSION SPRING
	20	YQM30001-27	TENSION SPRING
	21	SPST2606Z	SCREW,X3
	31	YQ40636A-1	DAMPER BRACKET ASSY
	32	YQ40298	DAMPER GEAR
	33	PU56781	DAMPER
	34	SDSP2006Z	SCREW
	35	PQM30017-23	SLIT WASHER
	36	SDST2606Z	SCREW
	37	YQ30216-1-3	END SENSOR BRACKET
	38	SDST2608Z	SCREW
	40	SDST2605Z	SCREW
	41	YQ40894	SCREW
	42	SDSP2604Z	SCREW,X2
	43	PU56571	LEAF SWITCH
	44	YU40548-1-1	BRUSH
	45	SDSP2004Z	SCREW
	46	YQ40808	C.MOTOR BRACKET
⚠	50	PDV2160A	DRUM ASSY
	51	PDM2094B-4	UPPER DRUM ASSY
	52	PDM4165A	DRUM SCREW ASSY,X2
	53	PDM2096A-3	LOWER DRUM MOTOR ASSY
	59	YQ40719	SHEET

6.5 MECHANISM ASSEMBLY < M4 >



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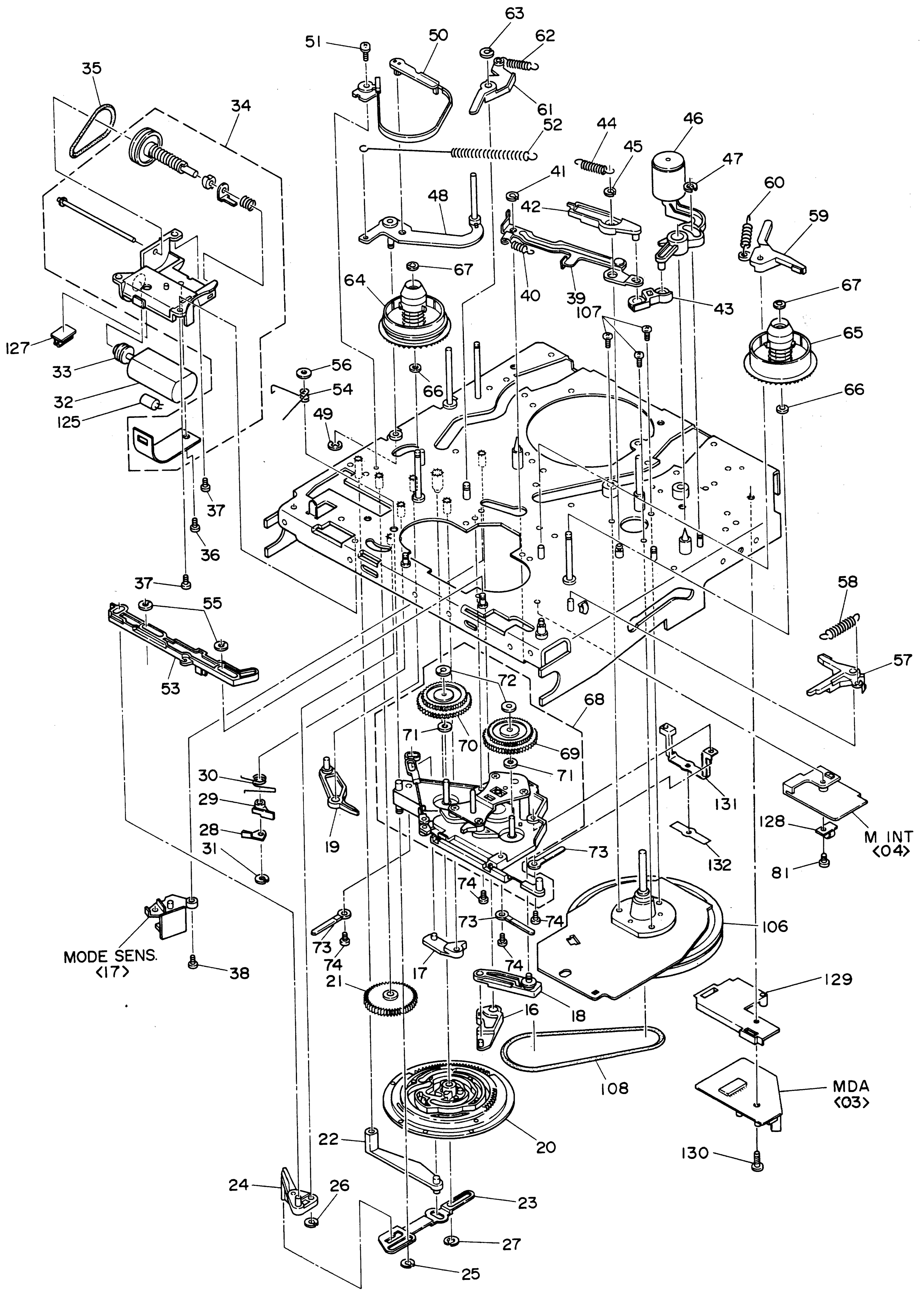
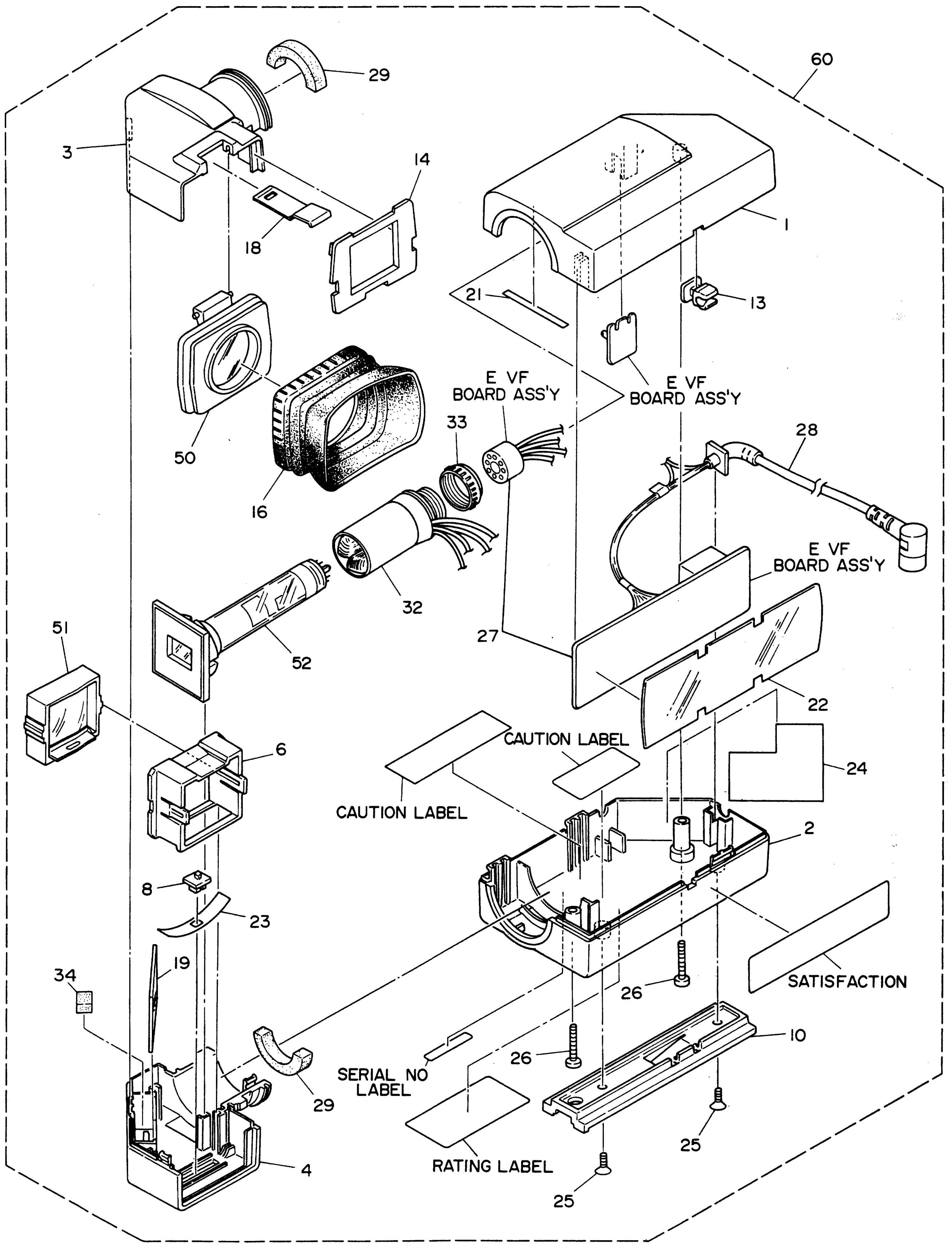


5. MECHANISM ASSEMBLY <M4>

#△	REF NO.	PART NO.	PART NAME, DESCRIPTION
	1	PQ31595	GUIDE RAIL(S)
	2	PQ31596	GUIDE RAIL(T)
	3	PQ41269-2	SPECIAL SCREW,X6
	4	YQ40617A-3	LOADING RING ASSY(S)
	5	YQ40621A-3	LOADING RING ASSY(T)
	6	PQ42786	GUIDE ROLLER,X9
	7	PQM30017-22	SLIT WASHER,X3
	8	PQ40822	CONNECT GEAR 1
	9	Q03093-817	WASHER
	10	PQM30017-24	SLIT WASHER
	11	PQ40823	CONNECT GEAR 2
	12	PQ31597	LOADING GEAR 1
	13	PQ30337	LOADING GEAR 2
	14	PQ41069	TORSION SPRING
	15	PQM30017-18	SLIT WASHER
	16	PQ42787	CAM LEVER 1
	17	PQ40827	CAM LEVER 2
	18	PQ42788A	RELAY ARM ASSY
	19	PQ40831A-1	CANCEL LAVER ASSY
	20	PQ20235	CONTROL CAM
	21	PQ40833	WORM WHEEL
	22	PQ40834A	CANCEL LEVER ASSY
	23	PQ40836-1-2	SLIDE PLATE
	24	PQ40837A-3	RELAY LEVER ASSY
	25	PQM30017-22	SLIT WASHER
	26	PQM30017-23	SLIT WASHER
	27	REE2500	"E" RING
	28	PQ41225-1-2	CAM BRAKE 1
	29	PQ41226	CAM BRAKE 2
	30	PQ41252-2-2	TORSION SPRING
	31	PQM30017-23	SLIT WASHER
△	32	YU40149C	MODE CONTROL MOTOR
	33	YQ40398	MOTOR PULLEY
	34	YU40181	MOTOR BRACKET UNIT
	35	PQM30003-15	BELT
	36	SDSG2004M	SCREW
	37	SDST2605Z	SCREW,X2
	38	SDSP2605Z	SCREW
	39	PQ30267B	PINCH ROLLER PLATE AY,INCL.40
	40	PQM30001-153	TENSION SPRING
	41	PQM30017-23	SLIT WASHER
	42	PQ40843	TOGGLE ARM 1
	43	PQ40844	TOGGLE ARM 2
	44	PQ41124-1-1	TENSION SPRING
	45	REE2500	"E" RING
	46	PQ42864A	PINCH ROLLER ARM ASSY
	47	PQM30017-22	SLIT WASHER
	48	YQ40630A	TENSION POLE ASSY
	49	REE2000	"E"RING
	50	PQ40851B	TENSION BAND ASSY
	51	SDSP2605Z	SCREW
	52	PQ40855-3	TENSION SPRING
	53	PQ30269-2	CONTROL PLATE
	54	YQ40813	TORSION SPRING
	55	PQM30017-22	SLIT WASHER,X2
	56	PQM30017-23	SLIT WASHER
	57	PQ40858B	SEARCH BRAKE ASSY
	58	PQM30001-222	TENSION SPRING
	59	PQ40860B-3	REW BRAKE ASSY,INCL.60
	60	YQM30001-21-4	TENSION SPRING
	61	PQ40862B-3	FF BRAKE ASSY,INCL.62
	62	YQM30001-22-4	TENSION SPRING
	63	PQM30017-24	SLIT WASHER
	64	YU40632	REEL DISK(S)
	65	YU40633	REEL DISK(T)
	66	Q03093-827	SPACER,X2
	67	PQM30017-26	SLIT WASHER,X2
	68	YU40426	CLUTCH MECHA ASSY,INCL.69-72
	69	PU56650-1-4	T-UP CLUTCH
	70	YU40427	SUP CLUTCH
	71	Q03093-827	SPACER,X2
	72	PQM30017-2	SLIT WASHER,X2
	73	PU49485-3	WIRE CLAMP,X3
	74	SDST2610Z	SCREW,X4
	75	PUS37229C	CASS. LED ASSY
	76	SDST2605Z	SCREW
	77	PQ42800	AL.SW.BRACKET
	78	PU58481	LEAF SWITCH
	79	SDSP2007Z	SCREW
	80	SDSP2604Z	SCREW
	81	SDST2612Z	SCREW
	82	PQ42904	HEAD BASE ASSY
	83	PU59771	AUDIO/CONTROL HEAD
	84	PQM30002-188	COMPRESSION SPRING,X3
	85	SPSP2008Z	SCREW,X3
	86	SDSP2604Z	SCREW,X2
	87	PQ42803	FE HEAD ARM
	88	PU56330	FULL ERASE HEAD
	89	SDSP2005Z	SCREW
	90	PQ42804	LOWER FLANGE,X2
	91	PQ42953	COLLAR
	92	PQ42806	TORSION SPRING
	93	PQM30002-189	COMPRESSION SPRING
	94	PQ42952	IMPEDANCE ROLLER
	95	Q03093-829	WASHER
	96	Q03093-831	WASHER,X2
	97	REE1500	"E" RING
	98	PQ40268-2	GUIDE FLANGE,X2
	99	PU53629-2	TAPE GUIDE
	100	PQ42999-2-1	GUIDE POLE CAP
	101	SDSP2005Z	SCREW
	102	YQ40653A-1	POLE BASE ASSY(SUPLLY)
	103	YQ40509B-2	POLE BASE ASSY(TAKE-UP)
	104	PQ40872	SPACER,X2
	105	PQ41269	SPECIAL SCREW,X2
△	106	YU40549V	CAPSTAN MOTOR
	107	SDSP2604Z	SCREW,X3
	108	PQM30003-12	BELT
	109	YU40550	DEW SENSOR
	110	SPSH1725M	SCREW
	111	PQ42841-1-2	DOOR GUIDE
	112	YQ40725	LID GUIDE
	113	SDST2605Z	SCREW
	114	YQ40634A-1	GUIDE ARM ASSY
	115	PQ42813	TORSION SPRING
	116	Q03093-829	WASHER,X2
	117	PQM30017-25	SLIT WASHER
	118	PQ31604A-7	LOCK PLATE ASSY
	119	YQM30001-26-5	SPRING
	120	PQM30017-8	SLIT WASHER,X2
	121	YQ40833-1-1	CANCEL LEVER,X2
	122	PQM30013-10	FLANGE COLLAR,X2
	123	PQ42817	TORSION SPRING,X2
	124	SDST2608Z	SCREW,X2
	125	QEPA1HM-105	NP E CAPACITOR
	126	Q03093-838	WASHER
	127	YU40245-01	WIRE.CLAMP
	128	YU40328-2	WIRE.CLAMP
	129	YQ40637-1-1	MDA HOLDER
	130	SDST2610Z	SCREW
	131	YQ40638	PWB HOLDER
	132	YU40592	M.SHEET

6.6 E VF ASSEMBLY < M5 >



#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION

6. ELECTRICAL VIEWFINDER ASSEMBLY <M5>

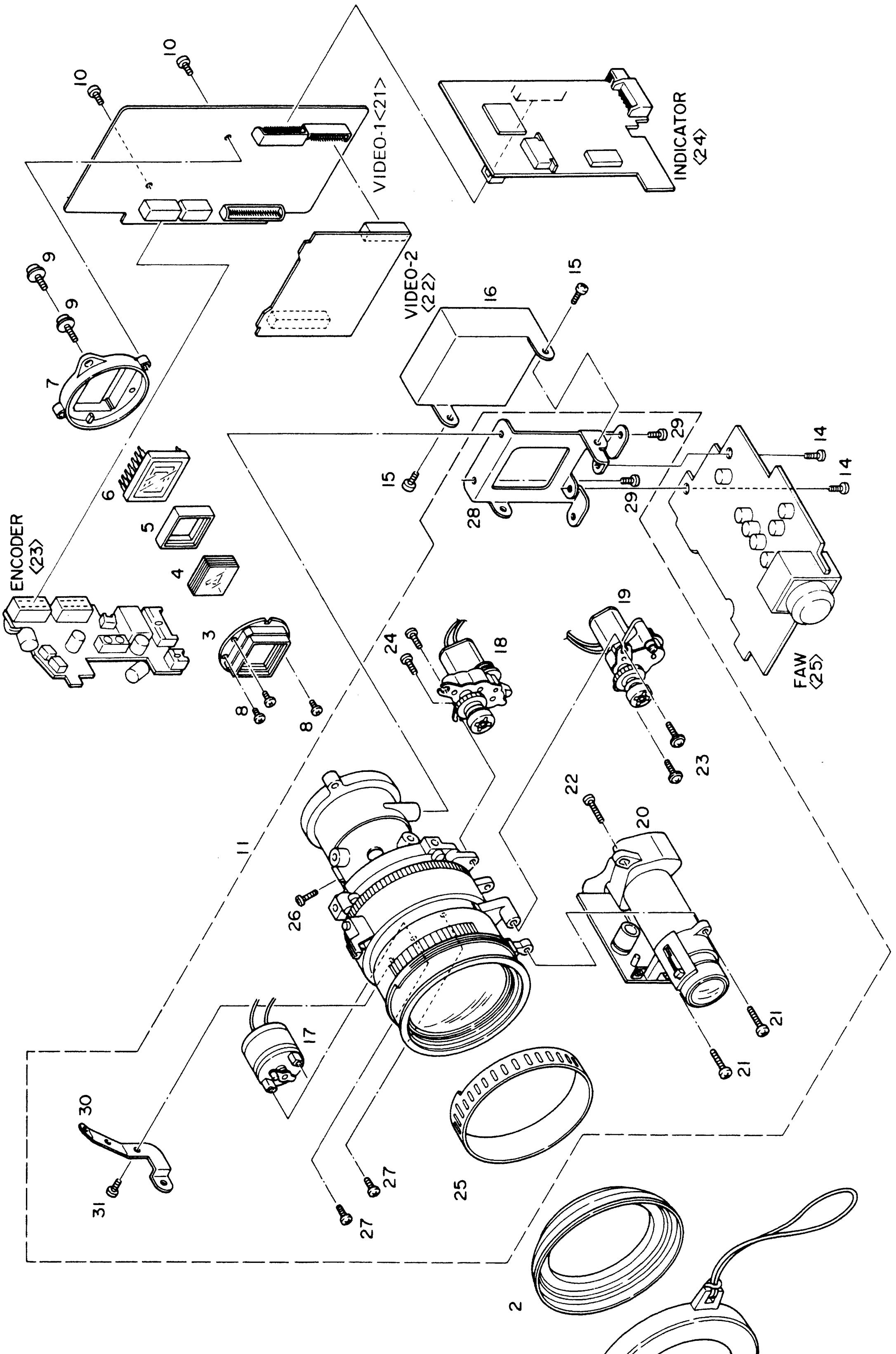
#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	1	YU30034-044	TOP CASE
	2	YU30034-002	BOTTOM CASE
	3	YU30034-003	CRT TOP CASE
	4	YU30034-004	CRT BOTTOM CASE
	6	YU30034-006	SLIDE HOLDER
	8	YU30034-008	SLIDE KNOB
	10	YU30034-010	SHOE
	13	YU30034-013	WIRE CLAMP
	14	YU30034-014	COVER
	16	YU30034-016	EYE CAP
	18	YU30034-018	LENS SPRING
	19	YU30034-019	MIRROR
	21	YU30034-021	LEAF SPRING
	22	YU30034-048	INSULATOR
	23	YU30034-023	SLIDE SEAT
	24	YU30034-033	INSULATOR
	25	YU30034-024	SCREW,X2
	26	YU30034-025	SCREW,X2
	27	YU30034-081	E. VIEWFINDER BOARD ASSY, INCL. 28
	28	YU30034-035	V.F.CABLE ASSY
	29	YU30034-028	SOFT TAPE,X2
	32	YU30174-031	DEFLECTION YOKE
	33	YU30034-034	SCREW
	34	YU30034-038	SOFT TAPE
	50	YU30174-050	LENS HOLDER ASSEMBLY
	51	YU30174-051	LENS CASE ASSEMBLY
	52	YU30174-052	CRT MASK ASSEMBLY
⚠	60	YU30249D	E.VIEWFINDER ASSY

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION

7. OPTICAL BLOCK ASSEMBLY <M6>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	1	YQ40437A-2	HOOD CAP ASSY
	2	YU40190	HOOD
	3	YQ30096	OPTICAL LPF HOLDER
	4	YU40907	OP LPF
	5	PQ42339	SPACER RUBBER
⚠	6	LZ2121	IC(CCD)
	7	YQ30043	IMAGER HOLDER
	8	SPSK2004F	MINI SCREW,X3
	9	DPSP2008Z	SCREW,X2
	10	SPSP2004Z	SCREW,X2
⚠	11	YU40635-3	OPTICAL BLOCK ASSY,INCL.17-31
	14	SPSH1730Z	SCREW,X2
	15	SPSH1730Z	SCREW,X2
⚠	16	YU40213-3	DC-DC CONVERTER
	OR	YU40192-5	DC-DC CONVERTER
	OR	YU40200-3	DC-DC CONVERTER
	17	YU40189-001	IRIS MOTOR
	18	YU40189-002	ZOOM SENSOR
	19	YU40189-003	AUTO FOCUS MOTOR
	20	YU40189-004	LCD SENSOR
	21	YU40189-005	SCREW,X2
	22	YU40189-006	SCREW
	23	YU40189-007	SCREW,X2
	24	YU40189-008	SCREW,X2
	25	YU40189-009	RABBER
	26	YU40189-010	SCREW
	27	YU40189-011	SCREW,X2
	28	YQ40431	OP BRACKET
	29	SDSF2605Z	TAPPING SCREW,X2
	30	YQ40600-1-1	OP BRACKET
	31	SDSF2605Z	TAPPING SCREW

6.7 OPTICAL ASSEMBLY < M6 >



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SECTION 7
ELECTRICAL PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS:

RESISTORS– All resistance values are in ohms (Ω), unless otherwise indicated.

k : 1,000 (Kilo)
M : 1,000,000 (Mega)
Chip R : Chip Resistor
Chip VR : Chip Variable Resistor
Comp. R : Composition Resistor
CR : Carbon Film Resistor
FR : Fusible Resistor
MFR : Metal Film Resistor
MPR : Metal Plate Resistor
OMR : Oxide Metal Film Resistor
PMR : Precision Metal Film Resistor
UFR : Unflammable Resistor
VR : Variable Resistor (Potentiometer)
WR : Wire Wound Resistor

CAPACITORS–All capacitance values are in μF, unless otherwise indicated.

pF : μμF (Pico farad)
C Cap : Caramic Capacitor
Chip Cap : Chip Capacitor
Chip T Cap : Chip Tantalum Capacitor
E Cap : Electrolytic Capacitor
FM Cap : Film Mica Capacitor
LL Cap : Low Leak Current Electrolytic Capacitor
MM Cap : Metalized Mylar Capacitor
MP Cap : Metalized Paper Capacitor
MY Cap : Mylar Capacitor
NP Cap : Non-polar Capacitor
PC Cap : Polycarbonate Capacitor
PP Cap : Polypropylene Capacitor
PS Cap : Polystyrol Capacitor
T Cap : Tantalum Capacitor
TF Cap : Thin Film Capacitor
TR Cap : Trimmer Capacitor

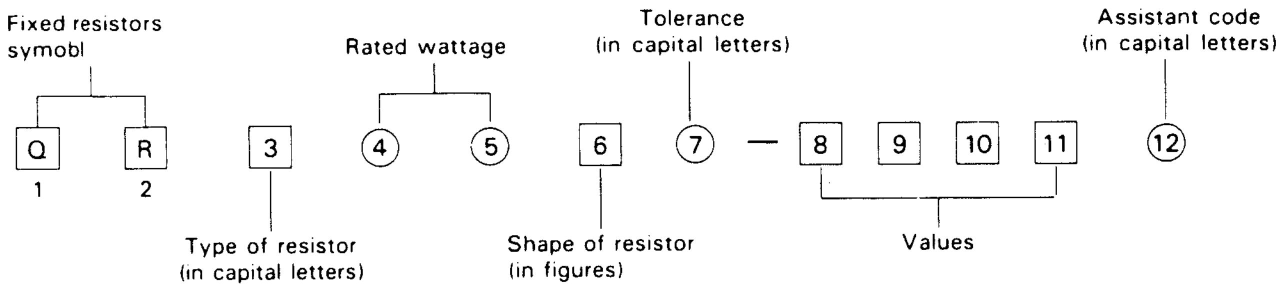
NOTES:

- [2 digits] indicates circuit board symbol number.
- "X " indicates quantity per set.

7.1 STANDARD PART NUMBER CODING

7.1.1 Fixed resistor coding

Fixed resistor part numbers are as follows.


Fixed resistors symobl
Rated wattage
Tolerance (in capital letters)
Assistant code (in capital letters)
Q
R
3
④
⑤
6
⑦
—
8
9
10
11
⑫
1
2
Type of resistor (in capital letters)
Shape of resistor (in figures)
Values

Type of resistor (third digit)

C	Composition resistors
D	Carbon film resistors
F	Unflammable resistors
G	Oxide metal film resistors
H	Fusible resistors
M	Metal plate resistors
S	Metal glazed resistors
V	Precision metal film resistors
W	Wire wound resistors
X	Metal film resistors
Z	Special resistors

Rated wattage
(fourth and fifth digits)

A0	1/10 W
18	1/8 W
16	1/6 W
14	1/4 W
12	1/2 W
01	1 W
02	2 W
03	3 W
04	4 W
05	5 W
06	6 W
07	7 W
75	7.5 W
08	8 W
10	10 W
15	15 W
A6	16 W
20	20 W
30	30 W

Tolerance
(seventh digit)

F	± 1 %
G	± 2 %
J	± 5 %
K	± 10 %
M	± 20 %

Assistant code
(twelfth digit)

A	Small type
B	Small type
S	Small type
Y	Lead taping
Z	Lead taping

Values
(eighth — tenth or eleventh digits)

examples:

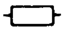
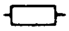
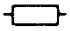
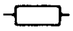
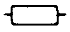
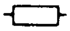
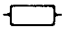
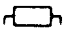
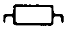
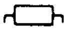
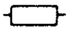
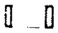
R47		0.47 Ω
4R7		4.7 Ω
470	47×10^{0}	47 Ω
471	47×10^{1}	470 Ω
472	47×10^{2}	4.7 kΩ
473	47×10^{3}	47 kΩ
474	47×10^{4}	470 kΩ
475	47×10^{5}	4.7 MΩ

QRV resistance shown by four digits:

4640	464×10^{0}	464 Ω
4641	464×10^{1}	4.64 kΩ
4642	464×10^{2}	46.4 kΩ

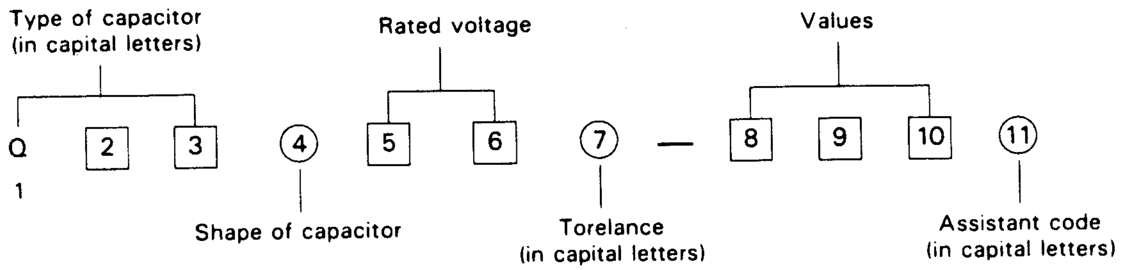
Shape of resistor (sixth digit)

Note: ■ indicates flame retardant resistor.

Type of resistor / Shape of resistor	C	D	F	G	H	M	S	V	W	X
1										
2										
3										
4										
5									(L) type	
6										
7			Lug (B) type							
8			Lug (A) type				 Chip			
9			Lug (C) type							

7.1.2 Fixed capacitor coding

Fixed capacitor part numbers are as follows.


Type of capacitor
(in capital letters)
Rated voltage
Values
Q
1
2
3
④
5
6
⑦
—
8
9
10
⑪
Shape of capacitor
Torelance
(in capital letters)
Assistant code
(in capital letters)

Ceramic capacitors

Type of capacitor (first – third digits)		Shape of capacitor (fourth digit)				
Symbol	Characteristics	Mono-direction	Kink lead	Axial lead	Axial forming lead	Chip
QCC	Ceramic	1		4	5	
QCD	High capacitance					A
QCF	High capacitance	1,4	3			8,A
QCS	Temperature compensation	1	3	4	5	8,A
QCT	Temperature compensation	Special coding				8,A
QCV	Ceramic			1	3	
QCX	Ceramic			1	3	
QCY	High capacitance	1,4	3	6	7	8,A
QCZ	Special type	Special coding				
QCB	Ceramic			B	C	

Electrolytic capacitors

Type of capacitor (first-third digits)		Shape of capacitor (fourth digit)				
Symbol	Characteristics	Tubular	Mono-direction	Anti-stress	Forming	Snap-in
QEB	Low leakage		4	5	6	
QEC	Low leakage		4,8,A	9,B	6,C	
QEE	Tantalum (normal)		4	5	6	
	Tantalum (small)		8			
QEF	Chip tantalum	8 (chip type)				
QEG	Low impedance		4			
QEK	Miniature type		4	5	6	
QEL	Small type		4	5	6	7
QEM	Small type		4,A	5	6	
QEN	Non-polar	2	4	5	6	
QEP	Non-polar (small)		4,A	5,B	6,C	
QER	Miniature type		4	5	6	
QET	Small type	2	4,A	5,B	6,C	7
QEU	Small type		4	5	6	
QEV	Small type		4		6	7
QEW	Normal	2	4	5	6	7

Paper film capacitors

Type of capacitor (first – third digits)		Shape of capacitor (fourth digit)				
		Tubular	Normal		Flame retardant	
Symbol	Characteristics		Mono-direction	Kink lead	Mono-direction	Kink lead
QFA	Metalized polypropylene				7	
QFE	Metalized mylar				5	
QFF	Film mica		4			
QFG	Polypropylene film		4	8		
QFH	Metalized mylar	2	4	3	5,7	6
QFJ	Mylar (special)		4			
QFK	Metalized mylar (small)				5	
QFM	Mylar	2	4	3,7	5	6
QFN	Mylar (small)		4	3		
QFP	Polypropylene		4	3,8		
QFS	Polystyrole	2	4	3		
QFV	Thin film		4	8		
QFZ	Special type	Special coding				

Rated voltage (fifth and sixth digits)

Sixth digit / Fifth digit	A	B	C	D	E	F	G	H	J	K	V	W	X
0						3.15	4.0		6.3				
1	10		16	20	25		40	50	63	80	35		
2	100	125	160	200	250	315	400	500	630		350	450	600
3	1000	1250		2000				5000					

Tolerance (seventh digit)

A	$^{+100}_{-10}$ %	M	±20 %
F	±1 %	N	±30 %
G	±2 %	P	$^{+100}_{-0}$ %
H	$^{+50}_{-10}$ %	R	$^{+30}_{-10}$ %
J	±5 %	X	$^{+40}_{-20}$ %
K	±10 %	Z	$^{+80}_{-20}$ %

Values (eighth – tenth digits)

Example : Values are in picofarads

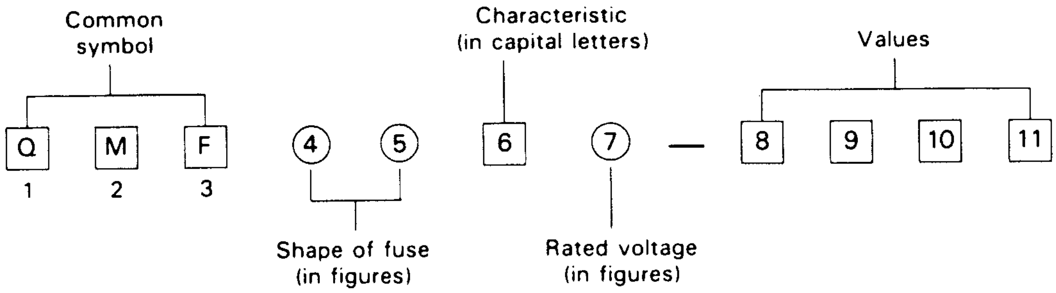
101	.... 10×10^1 pF	100 pF
102	.... 10×10^2 pF	1,000 pF (0.001 μF)
103	.... 10×10^3 pF	10,000 pF (0.01 μF)
104	.... 10×10^4 pF	100,000 pF (0.1 μF)
105	.... 10×10^5 pF	1 μF
5R0	....	5.0 pF

Assistant code (eleventh digit)

G	Small size
Z	Lead taping
Y	Lead taping

7.1.3 Fuse coding

Standard fuse part numbers are as follows.


Common
symbol
Characteristic
(in capital letters)
Values
Q
M
F
1
2
3
④
⑤
6
⑦
—
8
9
10
11
Shape of fuse
(in figures)
Rated voltage
(in figures)

Shape of fuse
(fourth and fifth digits)

51	φ5.2 × 20 mm
60	φ6.4 × 30 mm
61	φ6.35 × 31.8 mm
63	φ6.4 × 30 mm with lead wires
66	φ6.35 × 31.8 mm with lead wires
00	Special type

Rated voltage
(seventh digit)

1	AC125 V
2	AC250 V
3	0.1 – 1 A : AC250 V 1.25 – 6.3 A : AC125 V

Values
(eighth-tenth or eleventh digits)

example:

R63	.... 0.63 A
1R0	.... 1.0 A
2R5	.... 2.5 A
100	.... 10 A
R315	.... 0.315 A
1R25	.... 1.25 A

Characteristics (sixth digit)

Symbol	Fusing Current	Fusing Time	Remarks
A	210 %	Within 2 min.	Anti-rush type (for Europe)
	275 %	0.6 – 10 sec.	
	400 %	0.15 – 3 sec.	
	1000 %	0.02 – 0.3 sec.	
B	210 %	Within 30 min.	Regular fusible type (for SEMKO, Europe)
	275 %	0.05 – 2 sec.	
	400 %	0.01 – 0.3 sec.	
C	135 %	Within 1 hr.	Regular fusible type (for UL, Japan)
	200 %	Within 2 min.	
E	210 %	Within 2 min.	Anti-rush type (for Europe)
	275 %	0.6 – 10 sec.	
	400 %	0.15 – 3 sec.	
	1000 %	0.02 – 0.3 sec.	
J	135 %	Within 1 hr.	Anti-rush type
	200 %	Within 2 min.	
M	135 %	Within 1 hr.	Regular fusible type (for UL)
	200 %	Within 2 min.	
R	160 %	Within 1 hr.	Regular fusible type
	200 %	Within 2 min.	
S	160 %	Within 1 hr.	Anti-rush type
	200 %	Within 2 min.	
	700 % – 2000 %	Within 0.01 sec.	
U	135 %	Within 1 hr.	Anti-rush type (for UL)
	200 %	Within 2 min.	
	800 % – 2000 %	Within 0.01 sec.	

****

7. M/S/A BOARD ASSEMBLY <01>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB10013C1	M/S/A BOARD ASSY
	IC1	S-81250AG	IC
	IC2	M5236ML	IC
	IC101	BA6405F	IC
	IC102	BU3779S	IC
	IC103	BA10324F	IC
	IC104	BA728F	IC
	IC200	BA7751ALS	IC
	IC201	10VT30	IC
	IC301	HD6305Z0F-CV15	IC
	OR	HD63705Z0F-CV15	IC
	IC302	M54543ASL	IC
	IC303	S-8054HN	IC
	Q2	2SB1132(QR)	TRANSISTOR
	Q3	DTA143ZK	TRANSISTOR
	Q4	2SB766(QR)	TRANSISTOR
	Q5	2SJ146	TRANSISTOR
	Q6	DTA143ES	TRANSISTOR
	Q101	DTC124EK	TRANSISTOR
	Q102	DTC124EK	TRANSISTOR
	Q104	DTC124EK	TRANSISTOR
	Q105	DTC124EK	TRANSISTOR
	Q200	2SD1330S,T	TRANSISTOR
	Q202	FMW3	TRANSISTOR
	Q203	DTA124EK	TRANSISTOR
	Q204	DTC124TK	TRANSISTOR
	Q205	2SD1328S,T	TRANSISTOR
	Q206	IMH6	TRANSISTOR
	Q301	FMC2	TRANSISTOR
	Q302	FMC2	TRANSISTOR
	Q303	FMC2	TRANSISTOR
	Q304	DTC144EK	TRANSISTOR
	Q305	DTC144WK	TRANSISTOR
	Q306	DTC124EK	TRANSISTOR
	Q309	DTC124EK	TRANSISTOR
	D1	DAP202K	DIODE
	D2	FMN1	DIODE
	D3	1SS133	DIODE
	D4	RD20EB2	ZENER DIODE
	D5	1SS133	DIODE
	D6	RD6.8EB2	ZENER DIODE
	D7	RD6.8EB2	ZENER DIODE
	D101	DA204K	DIODE
	D102	DAN202K	DIODE
	D200	RD8.2M-T1B3	ZENER DIODE
	D201	IMN10	DIODE
	D301	IMN10	DIODE
	D302	DAN202K	DIODE
	D303	DAN202K	DIODE
	D307	DAN202K	DIODE
	R1	QRSA08J-472YN	RESISTOR
	R2	QRSA08J-102YN	RESISTOR
	R3	QRSA08J-223YN	RESISTOR
	R4	QVZ3531-472	V RESISTOR,BATTERY ALARM
	R5	QRSA08J-103YN	RESISTOR
	R6	QRSA08J-822YN	RESISTOR
	R7	QVZ3531-102	V RESISTOR,REG 8V ADJ
	R8	QRSA08J-221YN	RESISTOR
	R9	QRSA08J-105YN	RESISTOR
	R10	QRSA08J-123YN	RESISTOR
	R11	QRSA08J-102YN	RESISTOR
	R12	QRSA08J-824YN	RESISTOR
	R101	QRSA08J-105YN	RESISTOR
	R102	QRSA08J-104YN	RESISTOR
	R103	QRSA08J-104YN	RESISTOR
	R104	QRSA08J-182YN	RESISTOR
	R105	QRSA08J-333YN	RESISTOR
	R106	QRSA08J-474YN	RESISTOR
	R107	QRSA08J-471YN	RESISTOR
	R108	QRSA08J-102YN	RESISTOR
	R109	QRSA08J-103YN	RESISTOR
	R110	QRSA08J-822YN	RESISTOR
	R111	QRSA08J-103YN	RESISTOR
	R112	QRSA08J-472YN	RESISTOR
	R113	YU40529	V RESISTOR,TRACKING VR
	R114	QVZ3531-223	V RESISTOR,TRACKING PRESET
	R115	QRSA08J-223YN	RESISTOR
	R116	QRSA08J-222YN	RESISTOR
	R117	QRSA08J-681YN	RESISTOR
	R118	QRSA08J-104YN	RESISTOR
	R119	QRSA08J-104YN	RESISTOR
	R120	QRSA08J-124YN	RESISTOR
	R122	QRSA08J-472YN	RESISTOR
	R123	QRSA08J-103YN	RESISTOR
	R124	QVZ3531-474	V RESISTOR,PB CTL PULSE
	R125	QRSA08J-222YN	RESISTOR
	R126	QRSA08J-104YN	RESISTOR
	R127	QRSA08J-104YN	RESISTOR
	R128	QRSA08J-392YN	RESISTOR
	R129	QRSA08J-274YN	RESISTOR
	R130	QRSA08J-823YN	RESISTOR
	R131	QRSA08J-104YN	RESISTOR
	R132	QRSA08J-472YN	RESISTOR
	R133	QRSA08J-684YN	RESISTOR
	R134	QRSA08J-473YN	RESISTOR
	R135	QRSA08J-223YN	RESISTOR
	R136	QRSA08J-333YN	RESISTOR
	R137	QRSA08J-153YN	RESISTOR
	R138	QRSA08J-333YN	RESISTOR
	R139	QRSA08J-153YN	RESISTOR
	R140	QRSA08J-105YN	RESISTOR
	R141	QRSA08J-274YN	RESISTOR
	R142	QRSA08J-274YN	RESISTOR
	R143	QRSA08J-105YN	RESISTOR
	R144	QRSA08J-823YN	RESISTOR
	R145	QRSA08J-563YN	RESISTOR
	R147	QRSA08J-0R0Y	RESISTOR
	R201	QRSA08J-562YN	RESISTOR
	R202	QRSA08J-223YN	RESISTOR
	R203	QRSA08J-682YN	RESISTOR
	R206	QRSA08J-473YN	RESISTOR
	R207	QRSA08J-392YN	RESISTOR
	R208	QRSA08J-821YN	RESISTOR
	R209	QRSA08J-473YN	RESISTOR
	R210	QRSA08J-223YN	RESISTOR
	R211	QRSA08J-331YN	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R213	QRSA08J-102YN	RESISTOR
	R214	QRSA08J-272YN	RESISTOR
	R215	QRSA08J-562YN	RESISTOR
	R216	QRSA08J-473YN	RESISTOR
	R217	QRSA08J-223YN	RESISTOR
	R218	QVZ3531-103	V RESISTOR,AUDIO REC LEVEL
	R219	QRSA08J-105YN	RESISTOR
	R220	QRSA08J-332YN	RESISTOR
	R221	QRSA08J-124YN	RESISTOR
	R222	QRSA08J-331YN	RESISTOR
	R223	QRSA08J-273YN	RESISTOR
	R224	QRSA08J-100YN	RESISTOR
	R225	QVZ3531-333	V RESISTOR,AUDIO BIAS LEVEL
	R226	QRSA08J-102YN	RESISTOR
	R228	QRSA08J-333YN	RESISTOR
	R229	QRSA08J-563YN	RESISTOR
	R230	QRSA08J-331YN	RESISTOR
	R231	QRSA08J-182YN	RESISTOR
	R301	QRSA08J-472YN	RESISTOR
	R302	QRSA08J-103YN	RESISTOR
	R303	QRSA08J-473YN	RESISTOR
	R304	QRSA08J-102YN	RESISTOR
	R306	QRSA08J-103YN	RESISTOR
	R307	QRSA08J-103YN	RESISTOR
	R308	QRSA08J-103YN	RESISTOR
	R309	QRSA08J-103YN	RESISTOR
	R310	QRSA08J-103YN	RESISTOR
	R311	QRSA08J-472YN	RESISTOR
	R313	QRSA08J-103YN	RESISTOR
	R314	QRSA08J-102YN	RESISTOR
	R315	QRSA08J-103YN	RESISTOR
	R316	QRSA08J-103YN	RESISTOR
	R317	QRSA08J-102YN	RESISTOR
	R318	QRSA08J-103YN	RESISTOR
	R319	QRSA08J-103YN	RESISTOR
	R320	QRSA08J-223YN	RESISTOR
	R321	QRSA08J-222YN	RESISTOR
	R322	QRSA08J-333YN	RESISTOR
	R323	QRSA08J-103YN	RESISTOR
	R324	QRSA08J-333YN	RESISTOR
	R325	QRSA08J-103YN	RESISTOR
	R326	QRSA08J-333YN	RESISTOR
	R327	QRSA08J-103YN	RESISTOR
	R328	QRSA08J-333YN	RESISTOR
	R329	QRSA08J-333YN	RESISTOR
	R330	QRSA08J-333YN	RESISTOR
	R331	QRSA08J-103YN	RESISTOR
	R332	QRSA08J-333YN	RESISTOR
	R333	QRSA08J-222YN	RESISTOR
	R334	QRSA08J-222YN	RESISTOR
	R335	QRSA08J-222YN	RESISTOR
	R336	QRSA08J-222YN	RESISTOR
	R337	QRSA08J-222YN	RESISTOR
	R338	QRSA08J-222YN	RESISTOR
	R339	QRSA08J-333YN	RESISTOR
	R340	QRSA08J-333YN	RESISTOR
	R341	QRSA08J-333YN	RESISTOR
	R342	QRSA08J-333YN	RESISTOR
	R343	QRSA08J-333YN	RESISTOR
	R345	QRSA08J-333YN	RESISTOR
	R346	QRSA08J-333YN	RESISTOR
	R347	QRSA08J-222YN	RESISTOR
	R348	QRSA08J-102YN	RESISTOR
	R349	QRSA08J-102YN	RESISTOR
	R350	QRSA08J-102YN	RESISTOR
	R351	QRSA08J-203YN	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R352	QRSA08J-203YN	RESISTOR
	R353	QRSA08J-203YN	RESISTOR
	R354	QRSA08J-203YN	RESISTOR
	R355	QRSA08J-203YN	RESISTOR
	R356	QRSA08J-103YN	RESISTOR
	R357	QRSA08J-103YN	RESISTOR
	R358	QRSA08J-103YN	RESISTOR
	R359	QRSA08J-472YN	RESISTOR
	R360	QRSA08J-472YN	RESISTOR
	R361	QRSA08J-103YN	RESISTOR
	R362	QRSA08J-103YN	RESISTOR
	R363	QRSA08J-103YN	RESISTOR
	R364	QRSA08J-103YN	RESISTOR
	R365	QRSA08J-472YN	RESISTOR
	R367	QRSA08J-102YN	RESISTOR
	R368	QRSA08J-222YN	RESISTOR
	R369	QRSA08J-222YN	RESISTOR
	R370	QRSA08J-102YN	RESISTOR
	R371	QRSA08J-222YN	RESISTOR
	R373	QRSA08J-222YN	RESISTOR
	R374	QRSA08J-472YN	RESISTOR
	R375	QRSA08J-103YN	RESISTOR
	R376	QRSA08J-102YN	RESISTOR
	R377	QRSA08J-222YN	RESISTOR
	R378	QRSA08J-222YN	RESISTOR
	R380	QRSA08J-222YN	RESISTOR
	R381	QRSA08J-102YN	RESISTOR
	R382	QRSA08J-102YN	RESISTOR
	R383	QRSA08J-102YN	RESISTOR
	R384	QRSA08J-102YN	RESISTOR
	R385	QRSA08J-102YN	RESISTOR
	R386	QRSA08J-102YN	RESISTOR
	R387	QRSA08J-473YN	RESISTOR
	R388	QRSA08J-474YN	RESISTOR
	R389	QRSA08J-475YN	RESISTOR
	R391	QRSA08J-474YN	RESISTOR
	R392	QRSA08J-223YN	RESISTOR
	R393	QRSA08J-103YN	RESISTOR
	R394	QRSA08J-103YN	RESISTOR
	R397	QRSA08J-222YN	RESISTOR
	R398	QRSA08J-104YN	RESISTOR
	R399	QRSA08J-104YN	RESISTOR
	R400	QRSA08J-104YN	RESISTOR
	R401	QRSA08J-104YN	RESISTOR
	R402	QRSA08J-102YN	RESISTOR
	R403	QRSA08J-104YN	RESISTOR
	R404	QRSA08J-102YN	RESISTOR
	R405	QRSA08J-333YN	RESISTOR
	R409	QRSA08J-474YN	RESISTOR
	R411	QRSA08J-102YN	RESISTOR
	R412	QRSA08J-103YN	RESISTOR
	R413	QRSA08J-333YN	RESISTOR
	R414	QRSA08J-104YN	RESISTOR
	R415	QRSA08J-473YN	RESISTOR
	B101	QRSA08J-0R0YN	RESISTOR
	B201	QRSA08J-0R0YN	RESISTOR
	C1	QER40JM-107	E CAPACITOR
	C2	YU40265-5	E CAPACITOR
	C3	QED41AM-826	E CAPACITOR
	C4	QFN41HK-103	E CAPACITOR
	C5	QED41AM-826	E CAPACITOR
	C6	QED41CM-476	E CAPACITOR
	C7	QED41AM-826	E CAPACITOR
	C8	QFN41HK-473	M CAPACITOR
	C9	QER41HM-104	E CAPACITOR
	C10	QED41AM-826	E CAPACITOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C11	QER41CM-476	E CAPACITOR
	C101	QER41CM-226	E CAPACITOR
	C102	QCYA1HK-103	CAPACITOR
	C103	QER41CM-106ZE	E CAPACITOR
	C104	QER41HM-105ZE	E CAPACITOR
	C105	QCSA1HJ-471	CAPACITOR
	C106	QER41HM-105ZE	E CAPACITOR
	C107	QCYA1HK-222	CAPACITOR
	C108	QCYA1HK-102	CAPACITOR
	C109	QER41CM-476	E CAPACITOR
	C110	QER41CM-106	E CAPACITOR
	C111	QER41CM-106	E CAPACITOR
	C112	QFN41HJ-823	M CAPACITOR
	C113	QER40JM-107ZE	E CAPACITOR
	C114	QER40JM-476ZE	E CAPACITOR
	C115	QCYA1HK-102	CAPACITOR
	C116	QCYA1HK-102	CAPACITOR
	C117	QCYA1HK-103	CAPACITOR
	C118	QCYA1HK-102	CAPACITOR
	C119	QCYA1HK-102	CAPACITOR
	C121	QCYA1HK-153	CAPACITOR
	C122	QEPA1HM-224	NP E CAPACITOR
	C123	QEPA1HM-224	NP E CAPACITOR
	C124	QCYA1HK-332	CAPACITOR
	C125	QEPA1HM-474ZE	E CAPACITOR
	C126	QEPA1AM-106	NP E CAPACITOR
	C128	QCYA1HK-332	CAPACITOR
	C129	QCYA1HK-102	CAPACITOR
	C201	QER41AM-336ZE	E CAPACITOR
	C202	QER41AM-476ZE	E CAPACITOR
	C203	QER41HM-104ZE	E CAPACITOR
	C204	QCYA1HK-682	CAPACITOR
	C205	QER41AM-336ZE	E CAPACITOR
	C206	QER41EM-475ZE	E CAPACITOR
	C207	QCYA1EK-223	CAPACITOR
	C209	QER41HM-105ZE	E CAPACITOR
	C210	QER41CM-106ZE	E CAPACITOR
	C211	QER41CM-106ZE	E CAPACITOR
	C212	QER41AM-226ZE	E CAPACITOR
	C213	QER41HM-105ZE	E CAPACITOR
	C214	QCYA1HK-222	CAPACITOR
	C215	QER41HM-105ZE	E CAPACITOR
	C216	QCYA1EK-223	CAPACITOR
	C217	QER41CM-106ZE	E CAPACITOR
	C218	QER41HM-105ZE	E CAPACITOR
	C219	QCYA1HK-102	CAPACITOR
	C220	QCYA1HK-681	CAPACITOR
	C221	QCSA1HJ-331	CAPACITOR
	C222	PU58285-223J	PP CAPACITOR
	C223	QER41CM-106ZE	E CAPACITOR
	C224	QER41CM-476ZE	E CAPACITOR
	C225	QER40JM-226ZE	E CAPACITOR
	C227	QER41EM-475ZE	E CAPACITOR
	C228	QCF11HP-103	CAPACITOR
	C301	QER40JM-107	E CAPACITOR
	C302	QCSA1HJ-330	CAPACITOR
	C303	QCSA1HJ-330	CAPACITOR
	C304	QER41EM-475	E CAPACITOR
	C305	QER41CM-106	E CAPACITOR
	C306	QCFA1EZ-104	CAPACITOR
	C308	QCYA1HK-103	CAPACITOR
	C309	QCFA1EZ-104	CAPACITOR
	C311	QCSA1HJ-121	CAPACITOR
	C312	QCYA1HK-103	CAPACITOR
	C315	QCYA1HK-332	CAPACITOR
	L1	PU56181-151	CHOKE COIL
	L2	PU56181-470	CHOKE COIL
	L200	PU54710-562	COIL
⚠	L201	PU53617	OSC COIL
	L202	PU53223-101J	PEAKING COIL
⚠	X301	PU55812	RESONATOR
	DD1	YU40528	DC-DC CONVERTER
	TH301	QRD167J-0R0	RESISTOR
	CL1	YU40245-03	WIRE CLAMP,X3
	CL2	YU40245-05	WIRE CLAMP,X2
	CL3	YU40245-06	WIRE CLAMP
	SLD1	YQ40511	SHEET,X2
	TP101	PU56278	TEST-PIN
	TP200	PU56278	TEST PIN
	TP201	PU56278	TEST PIN
	TP202	PU56278	TEST PIN
	TP203	PU56278	TEST PIN
	TP204	PU56278	TEST PIN
	CN1	YU40532-24	B/B CN WFR R/A
	CN2	YU40105-14	1.5 B/B HOUSING
	CN3	YU40105-16	1.5 B/B HOUSING
	CN4	YU40108-10	1.0 FPC R/A(D)
	CN5	YU40108-10	1.0 FPC R/A(D)
	CN6	YU40531-12	B/B CN WFR R/A
	CN7	YU40531-12	B/B CN WFR R/A
	CN8	YU40095-4	W/B CN.WFR R/A
	CN10	YU40096-6	1.25 W/B (R/A)
⚠	CP1	ICP-F20	CIRCUIT PROTECTOR
⚠	CP2	ICP-F20	CIRCUIT PROTECTOR
⚠	CP3	ICP-F20	CIRCUIT PROTECTOR
⚠	CP4	ICP-F20	CIRCUIT PROTECTOR

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8. VIDEO BOARD ASSEMBLY (VTR) <02>

PWBA	YB10025B-01	VIDEO BOARD ASSY
IC1	AN3380NK	IC
IC2	BU4053BF	IC
IC3	PU22505B	IC,MODULE
IC4	7VT12	IC
IC101	5VT16	IC
IC201	PU22506A	IC,COLOR MODULE
Q1	DTC144EK	TRANSISTOR
Q2	2SC2412K(QR)	TRANSISTOR

*⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	Q3	2SC2412K(QR)	TRANSISTOR
	Q4	2SA1037K(QR)	TRANSISTOR
	Q5	2SC2412K(QR)	TRANSISTOR
	Q6	2SA1037K(QR)	TRANSISTOR
	Q7	2SC2412K(QR)	TRANSISTOR
	Q8	2SC2412K(QR)	TRANSISTOR
	Q9	2SC2412K(QR)	TRANSISTOR
	Q10	2SC2412K(QR)	TRANSISTOR
	Q11	2SA1037K(QR)	TRANSISTOR
	Q12	DTC144EK	TRANSISTOR
	Q13	DTC144EK	TRANSISTOR
	Q14	2SC2412K(QR)	TRANSISTOR
	Q15	2SA1037K(QR)	TRANSISTOR
	Q16	2SA1037K(QR)	TRANSISTOR
	Q17	2SC2412K(QR)	TRANSISTOR
	Q18	DTC144EK	TRANSISTOR
	Q19	2SC2412K(QR)	TRANSISTOR
	Q20	2SA1037K(QR)	TRANSISTOR
	Q21	2SA1037K(QR)	TRANSISTOR
	Q25	DTC124EK	TRANSISTOR
	Q26	DTA124EK	TRANSISTOR
	Q27	DTC144EK	TRANSISTOR
	Q101	DTA124EK	TRANSISTOR
	Q201	2SC2412K(QR)	TRANSISTOR
	Q202	DTC144EK	TRANSISTOR
	Q203	2SC2412K(QR)	TRANSISTOR
	Q204	2SC2412K(QR)	TRANSISTOR
	Q205	2SC2412K(QR)	TRANSISTOR
	Q206	DTC144EK	TRANSISTOR
	Q207	DTC144EK	TRANSISTOR
	Q208	2SC2412K(QR)	TRANSISTOR
	Q209	2SC2412K(QR)	TRANSISTOR
	Q210	2SC2412K(QR)	TRANSISTOR
	Q211	2SC2412K(QR)	TRANSISTOR
	Q212	DTC144EK	TRANSISTOR
	Q213	DTC144EK	TRANSISTOR
	Q214	DTC144EK	TRANSISTOR
	Q215	DTC144EK	TRANSISTOR
	Q216	DTC144EK	TRANSISTOR
	Q217	2SC2412K(QR)	TRANSISTOR
	Q218	DTC144EK	TRANSISTOR
	Q219	DTC144EK	TRANSISTOR
	D1	DAP202K	DIODE
	D2	DAP202K	DIODE
	D3	DAN202K	DIODE
	D4	DAN202K	DIODE
	D5	OA90	DIODE
	D6	OA90	DIODE
	D7	RD5.6EB2	ZENER DIODE
	D201	DAN202K	DIODE
	D202	DAP202K	DIODE
	D203	DAP202K	DIODE
	D204	DAP202K	DIODE
	D205	DAN202K	DIODE
	D206	DAP202K	DIODE
	R1	QRSA08J-153YN	RESISTOR
	R2	QRSA08J-333YN	RESISTOR
	R3	QRSA08J-563YN	RESISTOR
	R4	QRSA08J-272YN	RESISTOR
	R5	QRSA08J-271YN	RESISTOR
	R6	QRSA08J-121YN	RESISTOR
	R7	QRSA08J-131YN	RESISTOR
	R9	QRSA08J-332YN	RESISTOR
	R10	QVZ3531-222	V RESISTOR,VIDEO EQ
	R11	QRSA08J-102YN	RESISTOR
	R12	QRSA08J-222YN	RESISTOR

*⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R13	QRSA08J-102YN	RESISTOR
	R14	QRSA08J-681YN	RESISTOR
	R15	QRSA08J-561YN	RESISTOR
	R16	QRSA08J-153YN	RESISTOR
	R17	QRSA08J-333YN	RESISTOR
	R18	QRSA08J-102YN	RESISTOR
	R19	QRSA08J-122YN	RESISTOR
	R20	QRSA08J-331YN	RESISTOR
	R21	QRSA08J-152YN	RESISTOR
	R22	QRSA08J-471YN	RESISTOR
	R23	QRSA08J-102YN	RESISTOR
	R24	QRSA08J-102YN	RESISTOR
	R25	QRSA08J-182YN	RESISTOR
	R26	QRSA08J-222YN	RESISTOR
	R27	QRSA08J-102YN	RESISTOR
	R28	QRSA08J-222YN	RESISTOR
	R29	QRSA08J-222YN	RESISTOR
	R30	QRSA08J-223YN	RESISTOR
	R31	QRSA08J-223YN	RESISTOR
	R32	QVZ3531-102	V RESISTOR,REC FM LEVEL
	R34	QRSA08J-102YN	RESISTOR
	R35	QRSA08J-221YN	RESISTOR
	R36	QRSA08J-154YN	RESISTOR
	R37	QRSA08J-330YN	RESISTOR
	R38	QRSA08J-472YN	RESISTOR
	R39	QRSA08J-392YN	RESISTOR
	R40	QVZ3531-222	V RESISTOR,E-E COLOR LEVEL
	R41	QRSA08J-242YN	RESISTOR
	R42	QRSA08J-472YN	RESISTOR
	R43	QRSA08J-562YN	RESISTOR
	R44	QRSA08J-562YN	RESISTOR
	R45	QRSA08J-681YN	RESISTOR
	R46	QRSA08J-683YN	RESISTOR
	R47	QRSA08J-683YN	RESISTOR
	R48	QRSA08J-562YN	RESISTOR
	R49	QRSA08J-225YN	RESISTOR
	R50	QRSA08J-475YN	RESISTOR
	R52	QRSA08J-335YN	RESISTOR
	R53	QRSA08J-562YN	RESISTOR
	R54	QRSA08J-152YN	RESISTOR
	R55	QRSA08J-183YN	RESISTOR
	R56	QRSA08J-684YN	RESISTOR
	R57	QRSA08J-824YN	RESISTOR
	R58	QRSA08J-102YN	RESISTOR
	R59	QRSA08J-475YN	RESISTOR
	R60	QRSA08J-103YN	RESISTOR
	R61	QRSA08J-222YN	RESISTOR
	R62	QRSA08J-472YN	RESISTOR
	R63	QRSA08J-103YN	RESISTOR
	R64	QRSA08J-472YN	RESISTOR
	R65	QRSA08J-472YN	RESISTOR
	R66	QRSA08J-103YN	RESISTOR
	R67	QRSA08J-183YN	RESISTOR
	R68	QRSA08J-472YN	RESISTOR
	R69	QRSA08J-272YN	RESISTOR
	R70	QRSA08J-272YN	RESISTOR
	R71	QRSA08J-561YN	RESISTOR
	R72	QRSA08J-331YN	RESISTOR
	R73	QRSA08J-221YN	RESISTOR
	R74	QRSA08J-331YN	RESISTOR
	R75	QRSA08J-563YN	RESISTOR
	R76	QRD121J-271S	RESISTOR
	R77	QRD161J-750	RESISTOR
	R78	QRSA08J-563YN	RESISTOR
	R79	QRD161J-271	RESISTOR
	R80	QRSA08J-152YN	RESISTOR
	R81	QRSA08J-103YN	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R82	QRSA08J-103YN	RESISTOR
	R83	QRSA08J-103YN	RESISTOR
	R84	QRSA08J-103YN	RESISTOR
	R85	QRSA08J-103YN	RESISTOR
	R86	QRSA08J-103YN	RESISTOR
	R87	QRSA08J-222YN	RESISTOR
	R88	QRSA08J-101YN	RESISTOR
	R89	QRSA08J-0R0Y	RESISTOR
	R90	QRSA08J-0R0Y	RESISTOR
	R94	QRSA08J-562YN	RESISTOR
	R101	QRSA08J-103YN	RESISTOR
	R201	QRSA08J-222YN	RESISTOR
	R202	QRSA08J-153YN	RESISTOR
	R203	QRSA08J-222YN	RESISTOR
	R204	QRSA08J-103YN	RESISTOR
	R205	QRSA08J-821YN	RESISTOR
	R206	QVZ3531-151	V RESISTOR,REC COLOR LEVEL
	R207	QRSA08J-102YN	RESISTOR
	R208	QRSA08J-102YN	RESISTOR
	R209	QRSA08J-223YN	RESISTOR
	R210	QRSA08J-223YN	RESISTOR
	R211	QRSA08J-222YN	RESISTOR
	R212	QRSA08J-102YN	RESISTOR
	R213	QRSA08J-272YN	RESISTOR
	R214	QRSA08J-473YN	RESISTOR
	R215	QRSA08J-102YN	RESISTOR
	R216	QRSA08J-102YN	RESISTOR
	R217	QRSA08J-102YN	RESISTOR
	R218	QRSA08J-222YN	RESISTOR
	R219	QRSA08J-122YN	RESISTOR
	R220	QRSA08J-103YN	RESISTOR
	R221	QRSA08J-103YN	RESISTOR
	R222	QRSA08J-103YN	RESISTOR
	R223	QVZ3531-223	V RESISTOR,VXO
	R224	QRSA08J-274YN	RESISTOR
	R225	QRSA08J-472YN	RESISTOR
	R226	QRSA08J-223YN	RESISTOR
	R227	QRSA08J-153YN	RESISTOR
	R228	QRSA08J-393YN	RESISTOR
	R229	QRSA08J-222YN	RESISTOR
	R230	QRSA08J-222YN	RESISTOR
	R231	QRSA08J-122YN	RESISTOR
	R233	QRSA08J-391YN	RESISTOR
	R234	QRSA08J-221YN	RESISTOR
	R235	QRSA08J-391YN	RESISTOR
	R236	QRSA08J-821YN	RESISTOR
	R237	QRSA08J-181YN	RESISTOR
	R238	QRSA08J-223YN	RESISTOR
	R239	QRSA08J-681YN	RESISTOR
	R240	QRSA08J-822YN	RESISTOR
	R241	QRSA08J-393YN	RESISTOR
	R242	QRSA08J-391YN	RESISTOR
	R243	QRSA08J-331YN	RESISTOR
	R244	QRSA08J-102YN	RESISTOR
	R245	QRSA08J-181YN	RESISTOR
	R246	QRSA08J-223YN	RESISTOR
	R247	QRSA08J-682YN	RESISTOR
	R248	QRSA08J-152YN	RESISTOR
	R249	QRSA08J-471YN	RESISTOR
	R250	QRSA08J-102YN	RESISTOR
	R251	QRSA08J-122YN	RESISTOR
	R252	QRSA08J-103YN	RESISTOR
	R253	QRSA08J-103YN	RESISTOR
	R255	QRSA08J-562YN	RESISTOR
	R256	QRSA08J-271YN	RESISTOR
	R257	QRSA08J-561YN	RESISTOR
	R258	QRSA08J-682YN	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R259	QRSA08J-104YN	RESISTOR
	C1	QCYA1HK-103	CAPACITOR
	C2	QCYA1HK-103	CAPACITOR
	C3	QFV41HJ-104	TF CAPACITOR
	C4	QCYA1HK-103	CAPACITOR
	C5	QEE81AM-335	TANTAL CAPACITOR
	C6	QEKG0JM-476	E CAPACITOR
	C7	QCYA1HK-223	CAPACITOR
	C8	QCSA1HJ-121	CAPACITOR
	C9	QCYA1HK-103	CAPACITOR
	C10	QFZ0095-104	MM CAPACITOR
	C11	QER41CM-106ZE	E CAPACITOR
	C12	QCSA1HJ-820	CAPACITOR
	C13	QCSA1HJ-820	CAPACITOR
	C14	QER41CM-106ZE	E CAPACITOR
	C15	QCYA1HK-103	CAPACITOR
	C16	QEE80JM-685	TANTAL CAPACITOR
	C17	QCYA1HK-103	CAPACITOR
	C18	QCSA1HJ-470	CAPACITOR
	C19	QCSA1HJ-220	CAPACITOR
	C20	QCYA1HK-103	CAPACITOR
	C21	QCSA1HJ-180	CAPACITOR
	C22	QCSA1HJ-330	CAPACITOR
	C23	QCSA1HJ-220	CAPACITOR
	C24	QCSA1HJ-681	CAPACITOR
	C25	QCYA1HK-103	CAPACITOR
	C26	QEKG0JM-476	E CAPACITOR
	C27	QCYA1HK-103	CAPACITOR
	C28	QCSA1HJ-121	CAPACITOR
	C29	QCSA1HJ-180	CAPACITOR
	C30	QCYA1HK-103	CAPACITOR
	C31	QCYA1HK-103	CAPACITOR
	C32	QCSA1HJ-121	CAPACITOR
	C33	QCSA1HJ-121	CAPACITOR
	C34	QCSA1HJ-270	CAPACITOR
	C35	QCYA1HK-103	CAPACITOR
	C36	QCSA1HJ-471	CAPACITOR
	C37	QEKG0JM-227	E CAPACITOR
	C39	QEKG1CM-106	E CAPACITOR
	C40	QCYA1HK-103	CAPACITOR
	C41	QEKG0JM-476	E CAPACITOR
	C42	QEKG0JM-476	E CAPACITOR
	C43	QEKG0JM-476	E CAPACITOR
	C44	QCYA1HK-103	CAPACITOR
	C45	QCSA1HJ-101	CAPACITOR
	C46	QCSA1HJ-101	CAPACITOR
	C47	QCSA1HJ-151	CAPACITOR
	C48	QCSA1HJ-330	CAPACITOR
	C50	QEPA1HM-105ZE	NP E CAPACITOR
	C51	QEKG1HM-105	E CAPACITOR
	C52	QCSA1HJ-331	CAPACITOR
	C53	QCSA1HJ-181	CAPACITOR
	C54	QED40JM-127	E CAPACITOR
	C55	QCYA1HK-103	CAPACITOR
	C56	QCSA1HJ-151	CAPACITOR
	C57	QEKG1HM-225	E CAPACITOR
	C58	QEKG0JM-107	E CAPACITOR
	C59	QCYA1HK-103	CAPACITOR
	C60	QEKG1HM-335	E CAPACITOR
	C61	QEKG1HM-105	E CAPACITOR
	C62	QCSA1HJ-680	CAPACITOR
	C63	QEKG1EM-335	E CAPACITOR
	C64	QEKG1HM-225	E CAPACITOR
	C65	QEKG1EM-335	E CAPACITOR
	C66	QEKG1CM-106	E CAPACITOR
	C67	QEKG1EM-335	E CAPACITOR
	C68	QEKG0JM-107	E CAPACITOR

*⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C69	QCYA1HK-103	CAPACITOR
	C70	QEKG0JM-107	E CAPACITOR
	C71	QEKG1EM-475	E CAPACITOR
	C72	QETA0JM-108	E CAPACITOR
	C73	QEKG1AM-476	E CAPACITOR
	C74	QCSA1HJ-121	CAPACITOR
	C75	QCSA1HJ-220	CAPACITOR
	C76	QCSA1HJ-560	CAPACITOR
	C77	QCSA1HJ-121	CAPACITOR
	C78	QEKG1HM-104	E CAPACITOR
	C80	QRSA08J-0R0Y	RESISTOR
	C101	QCS11HJ-271	CAPACITOR
	C102	QEKG1HM-104	E CAPACITOR
	C201	QCYA1HK-103	CAPACITOR
	C202	QCYA1HK-103	CAPACITOR
	C203	QCYA1HK-682	CAPACITOR
	C204	QCSA1HJ-820	CAPACITOR
	C205	QCYA1HK-103	CAPACITOR
	C206	QCYA1HK-102	CAPACITOR
	C207	QFN41HJ-473	M CAPACITOR
	C208	QCYA1HK-102	CAPACITOR
	C209	QEKG1CM-106	E CAPACITOR
	C210	QCYA1HK-103	CAPACITOR
	C211	QCTA1CH-220	CAPACITOR
	C212	QFN41HJ-223	M CAPACITOR
	C213	QEKG1HM-105	E CAPACITOR
	C214	QFN41HJ-273	M CAPACITOR
	C215	QER40JM-476ZE	E CAPACITOR
	C216	QCYA1HK-103	CAPACITOR
	C217	QEKG1EM-475	E CAPACITOR
	C218	QCYA1HK-103	CAPACITOR
	C219	QFV41HJ-563	TF CAPACITOR
	C220	QEKG1EM-335	E CAPACITOR
	C221	QEKG1HM-105	E CAPACITOR
	C222	QEKG1CM-106	E CAPACITOR
	C223	QCSA1HJ-221	CAPACITOR
	C224	QCYA1HK-103	CAPACITOR
	C225	QCSA1HJ-6R0	CAPACITOR
	C226	QCYA1HK-102	CAPACITOR
	C227	QEKG0JM-476	E CAPACITOR
	C228	QCYA1HK-103	CAPACITOR
	C229	QCYA1HK-103	CAPACITOR
	C230	QCYA1HK-102	CAPACITOR
	C231	QEE81EM-105	CAPACITOR
	C232	QER41HM-475	E CAPACITOR
	C233	QER41HM-475	E CAPACITOR
	C234	QEKG1CM-106	E CAPACITOR
	C235	QFV41HJ-224	M CAPACITOR
	C236	QFN41HJ-563	M CAPACITOR
	C238	QFN41HJ-103	M CAPACITOR
	C239	QFV41HJ-104	TF CAPACITOR
	C240	QCYA1HK-332	CAPACITOR
	L1	PU53223-101J	PEAKING COIL
	L2	PU59152-8R2J	PEAKING COIL
	L3	PU59152-8R2J	PEAKING COIL
	L4	PU53223-101J	PEAKING COIL
	L5	PU59152-180J	PEAKING COIL
	L6	PU59152-560J	PEAKING COIL
	L7	PU59152-680J	PEAKING COIL
	L8	PU59152-330J	PEAKING COIL
	L9	PU59152-330J	PEAKING COIL
	L10	PU59152-151J	PEAKING COIL
	L11	PU59152-680J	PEAKING COIL
	L12	PU59152-220J	PEAKING COIL
	L13	PU53223-101J	PEAKING COIL
	L14	PU59152-221J	PEAKING COIL
	L15	PU59152-680J	PEAKING COIL
	L16	PU59152-220J	PEAKING COIL
	L17	PU53223-101J	PEAKING COIL
	L19	PU59152-120J	PEAKING COIL
	L20	PU59152-120J	PEAKING COIL
	L21	PU53618-471J	PEAKING COIL
	L22	PU59152-121J	PEAKING COIL
	L23	PU59152-121J	PEAKING COIL
	L24	PU53223-101J	PEAKING COIL
	L25	PU53223-101J	PEAKING COIL
	L26	PU59152-560J	PEAKING COIL
	L101	PU59152-1R2K	PEAKING COIL
	L102	PU53223-101J	PEAKING COIL
	L103	PU56175	S.TRANS
	L201	PU53223-101J	PEAKING COIL
	L202	PU53618-821J	PEAKING COIL
	L203	PU48530-222J	PEAKING COIL
	L204	PU53223-101J	PEAKING COIL
	L205	PU59152-820J	PEAKING COIL
	L206	PU59152-150J	PEAKING COIL
	L207	PU53223-101J	PEAKING COIL
	L208	PU54710-822	COIL
	EQ201	PU53501-4	EQUALIZER
	LPF1	PU58021-2	LOW PASS FILTER
	LPF201	PU54988	LOW PASS FILTER
	LPF202	PU58705	LOW PASS FILTER
	BPF201	PU54410-2	BAND PASS FILTER
	BPF202	PU57072	BAND PASS FILTER
	DL1	PU58318	DELAY LINE
	DL201	PU60066	2H DELAY LINE
⚠	XB201	PU60065	CRYSTAL RESONATOR
⚠	X201	PU59335	CRYSTAL RESONATOR
	TH1	ERT-D2FGL101S	THERMISTOR
	CL1	YU40245-05	WIRE CLAMP
	CL2	YU40245-03	WIRE CLAMP,X2
	SLD1	YU40142	SHIELD CASE(1)
	SLD2	YU40143	SHIELD CASE(2)
	SLD3	YU40537-1-2	SHIELD CASE(3)
	SLD4	YU40538-1-3	SHIELD CASE(4)
	SLD5	YU40652	SHIELD PLATE
	SPC1	PQM30029-83	SPACER
	TP0	YU40536	TEST POINT,TPGND
	TP1	PU56278	TEST PIN
	TP4	PU56278	TEST PIN
	TP6	YU40536	TEST POINT
	TP9	YU40581	CHIP TP(2125)
	TP00	PU56278	TEST PIN,TPVXO
	TP10	PU56278	TEST PIN
	TP11	YU40536	TEST POINT
	TP12	YU40536	TEST POINT
	TP31	YU40581	CHIP TP(2125)
	TP41	YU40536	TEST POINT
	TP44	PU56278	TEST PIN
	TP101	PU56278	TEST PIN

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	TP201	PU56278	TEST PIN
	TP204	YU40536	TEST POINT
	TP210	PU56278	TEST PIN
	TP229	YU40536	TEST POINT
	CN1	YU40096-5	1.25 W/B (R/A)
	CN2	YU40108-8	1.0 FPC R/A(D)
	CN3	YU40095-2Y	W/B CN.WFR R/A
	CN4	YU40095-2	W/B CN.WFR R/A
	CN5	YU40095-4	W/B CN.WFR R/A
	CN6	YU40095-3	W/B CN.WFR R/A
	CN7	YU40096-3	1.25 W/B (R/A)
	CN8	YU40530-12	B/B CON.WFR R/A
	CN9	YU40530-12	B/B CON.WFR R/A

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9. D.MDA BOARD ASSEMBLY <03>

	PWBA	YB10013A2-02	MDA BOARD ASSY
	IC501	BA6452F	IC
	D501	DAN202K	DIODE
	R501	QRSA08J-152YN	RESISTOR
	R502	QRSA08J-154YN	RESISTOR
	R503	QRSA08J-223YN	RESISTOR
	R504	QRSA08J-222YN	RESISTOR
	R505	QRSA08J-101YN	RESISTOR
	R506	QRSA08J-2R2YN	RESISTOR
	R507	QRSA08J-2R2YN	RESISTOR
	R508	QRSA08J-2R2YN	RESISTOR
	R509	QRG125J-R68AR	OMF RESISTOR
	R510	QRSA08J-104YN	RESISTOR
	C501	QCY81CK-224	CAPACITOR
	C502	QCSA1HJ-471	CAPACITOR
	C503	QCY81CK-224	CAPACITOR
	C504	QCFA1EZ-104	CAPACITOR
	C505	QER41CM-106ZE	E CAPACITOR
	C506	QER41CM-106ZE	E CAPACITOR
	C507	QCYA1EK-223	CAPACITOR
	C508	QER41CM-106ZE	E CAPACITOR
	C509	QER41CM-106ZE	E CAPACITOR
	C510	QER41CM-106ZE	E CAPACITOR
	C511	QCFA1EZ-104	CAPACITOR
	CN501	YU40533-14	B/B CON.WFR
	CN502	YU40095-2	W/B CN.WFR R/A
	CN503	YU40095-15	W/B CN.WFR R/A
	CN504	YU40095-2	W/B CN.WFR R/A

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10. MECHACON INTERFACE BOARD ASSEMBLY <04>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB10013A3-02	MECHACON INTERFACE BOARD ASSY
	IC601	BX7469	IC
	IC602	GP2L09BC	IC,PHOTO SENSOR
	Q601	DTA124EF	TRANSISTOR
	R601	QRD167J-102	RESISTOR
	R602	QRD167J-471	RESISTOR
	R603	QRD167J-472	RESISTOR
	R604	QRD167J-680	RESISTOR
	R605	QRSA08J-0R0YN	RESISTOR
	C601	QEPA1HM-105	NP E CAPACITOR
	HD1	YQ30060-1-2	TU.SENS.HOLDER
	CN601	YU40533-16	B/B CN WFR
	CN602	YU40095-2Y	W/B CN.WFR R/A
	CN603	YU40095-2B	W/B CN.WFR R/A
	CN604	YU40095-2	W/B CN.WFR R/A
	CN605	YU40095-2R	W/B CN.WFR R/A
	CN606	YU40095-2B	W/B CN.WFR R/A
	CN607	YU40095-4	W/B CN.WFR R/A
	CN608	YU40095-6	W/B CN.WFR R/A

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11. MIC2 BOARD ASSEMBLY <05>

	PWBA	YB10013A5-02	MIC 2 BOARD ASSY
	IC701	M5282FP	IC
	R704	QRSA08J-100YN	RESISTOR
	R705	QRSA08J-473YN	RESISTOR
	R706	QRSA08J-102YN	RESISTOR
	R707	QRSA08J-183YN	RESISTOR
	R708	QRSA08J-333YN	RESISTOR
	R709	QRSA08J-103YN	RESISTOR
	R710	QRSA08J-682YN	RESISTOR
	R711	QRSA08J-100YN	RESISTOR
	R712	QRD162J-101	RESISTOR
	C703	QER41EM-475ZE	E CAPACITOR
	C704	QER40JM-476ZE	E CAPACITOR
	C705	QCYA1HK-102	CAPACITOR
	C706	QER41EM-475ZE	E CAPACITOR
	C707	QCYA1HK-122	CAPACITOR
	C708	QER41EM-475ZE	E CAPACITOR
	C709	QER40JM-107ZE	E CAPACITOR
	C710	QER41CM-106ZE	E CAPACITOR
	C711	QER40JM-336ZE	E CAPACITOR

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12. MIC1 BOARD ASSEMBLY <06>

	PWBA	YB10013B4	MIC 1 BOARD ASSY
	R701	QRSA08J-561YN	RESISTOR
	R702	QRSA08J-562YN	RESISTOR
	C701	QER40JM-226ZE	E CAPACITOR
	C702	QER40JM-476ZE	E CAPACITOR
	L702	PU53223-101J	PEAKING COIL
	J701	YU40858	MIC JACK
	CN701	YU40095-2	W/B CN.WFR R/A

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	CN702	YU40095-4	W/B CN.WFR R/A

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13. TRIGER BOARD ASSEMBLY <07>

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#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20078B2	TRIGGER BOARD ASSY
	D2	ERA81-004	DIODE
	R14	QRD167J-683	RESISTOR
	SW19	PU59843	TRIGGER SW
⚠	HD1	YU40170	FUSE CLIP,X2
	CN6	YU40095-3	W/B CN.WFR R/A
	CN7	YU40096-4	W/B CN.WFR R/A
⚠	F1	QMF51E2-3R15	FUSE, NOT INCL. T BOARD ASSY

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14. VIDEO-1 BOARD ASSEMBLY <21>

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#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20062K-C	VIDEO-1 BOARD ASSY
	IC2	CP1088G	IC
	IC3	MC8089A	IC
	IC4	UPC2370GH	IC
	IC5	MSM6831	IC
	IC9	THE225A	IC
	Q1	2SA1576(QR)	TRANSISTOR
	OR	2SA1532(BC)	TRANSISTOR
	Q2	2SD1819(RS)	TRANSISTOR
	Q3	2SC4098(PQ)	TRANSISTOR
	OR	2SC3936(BC)	TRANSISTOR
	Q4	2SB1218(RS)	TRANSISTOR
	Q8	2SD1819(RS)	TRANSISTOR
	Q12	2SA1576(QR)	TRANSISTOR
	OR	2SA1532(BC)	TRANSISTOR
	Q13	2SA1532(BC)	TRANSISTOR
	OR	2SA1576(QR)	TRANSISTOR
	Q14	2SA1576(QR)	TRANSISTOR
	OR	2SA1532(BC)	TRANSISTOR
	Q15	2SA1532(BC)	TRANSISTOR
	OR	2SA1576(QR)	TRANSISTOR
	Q16	2SA1576(QR)	TRANSISTOR
	OR	2SA1532(BC)	TRANSISTOR
	Q17	2SC3936(BC)	TRANSISTOR
	OR	2SC4098(PQ)	TRANSISTOR
	Q18	2SC4098(PQ)	TRANSISTOR
	OR	2SC3936(BC)	TRANSISTOR
	Q29	2SA1576(QR)	TRANSISTOR
	OR	2SA1532(BC)	TRANSISTOR
	Q30	2SC3936(BC)	TRANSISTOR
	OR	2SC4098(PQ)	TRANSISTOR
	Q31	2SC4098(PQ)	TRANSISTOR
	OR	2SC3936(BC)	TRANSISTOR
	Q32	2SA1532(BC)	TRANSISTOR
	OR	2SA1576(QR)	TRANSISTOR
	Q33	2SC3931(CD)	TRANSISTOR
	Q34	2SA1576(QR)	TRANSISTOR
	OR	2SA1532(BC)	TRANSISTOR
	Q35	2SA1532(BC)	TRANSISTOR
	OR	2SA1576(QR)	TRANSISTOR
	Q40	2SC4098(PQ)	TRANSISTOR
	OR	2SC3936(BC)	TRANSISTOR
	D1	MA143	DIODE
	D2	MA141WA	DIODE
	D3	MA141WA	DIODE
	R2	NRSA63J-332N	RESISTOR
	R3	NRSA63J-122N	RESISTOR
	R4	NRSA63J-182N	RESISTOR
	R5	NRSA63J-105N	RESISTOR
	R7	NRSA63J-102N	RESISTOR
	R8	NRSA63J-512N	RESISTOR
	R9	NRSA63J-102N	RESISTOR
	R10	NRSA63J-102N	RESISTOR
	R11	NRSA63J-393N	RESISTOR
	R12	NRSA63J-683N	RESISTOR
	R16	NRSA63J-562N	RESISTOR
	R17	NRSA63J-102N	RESISTOR
	R18	NRSA63J-330N	RESISTOR
	R19	NRSA63J-151N	RESISTOR
	R20	NRSA63J-151N	RESISTOR
	R21	NRSA63J-303N	RESISTOR
	R22	NRSA63J-333N	RESISTOR
	R23	NRSA63J-332N	RESISTOR
	R24	NRSA63J-220N	RESISTOR
	R25	NRSA63J-104N	RESISTOR
	R26	NRSA63J-472N	RESISTOR
	R27	NRSA63J-104N	RESISTOR
	R28	NRSA63J-912N	RESISTOR
	R29	NVP1301-104N	V RESISTOR,BLOOMING
	R30	NRSA63J-183N	RESISTOR
	R31	NVP1301-223N	V RESISTOR,OB LEVEL
	R33	NRSA63J-184N	RESISTOR
	R34	NRSA63J-0R0A	RESISTOR
	R35	NRSA63J-0R0A	RESISTOR
	R36	NRSA63J-472N	RESISTOR
	R38	NRSA63J-0R0A	RESISTOR
	R40	NRSA63J-473N	RESISTOR
	R41	NVP1301-223N	V RESISTOR,IRIS ADJ
	R42	NRSA63J-223N	RESISTOR
	R43	NRSA63J-303N	RESISTOR
	R44	NRSA63J-123N	RESISTOR
	R45	NRSA63J-103N	RESISTOR
	R46	NRSA63J-473N	RESISTOR
	R47	NRSA63J-563N	RESISTOR
	R48	NRSA63J-102N	RESISTOR
	R49	NVP1301-103N	V RESISTOR,B SEPA
	R50	NRSA63J-102N	RESISTOR
	R52	NVP1301-103N	V RESISTOR,R SEPA
	R54	NVP1301-103N	V RESISTOR,R LEVEL
	R55	NRSA63J-102N	RESISTOR
	R56	NVP1301-103N	V RESISTOR,B LEVEL
	R57	NRSA63J-102N	RESISTOR
	R58	NVP1301-103N	V RESISTOR,YH LEVEL
	R60	NRSA63J-562N	RESISTOR
	R61	NRSA63J-222N	RESISTOR
	R62	NRSA63J-102N	RESISTOR
	R63	NRSA63J-102N	RESISTOR
	R64	NRSA63J-102N	RESISTOR
	R65	NRSA63J-102N	RESISTOR
	R66	NVP1301-103N	V RESISTOR,YH SET UP
	R67	NVP1301-103N	V RESISTOR,YL SET UP
	R68	NVP1301-103N	V RESISTOR,R SET UP

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R69	NRSA63J-183N	RESISTOR
	R70	NRSA63J-243N	RESISTOR
	R71	NRSA63G-273N	RESISTOR
	R72	NRSA63G-393N	RESISTOR
	R73	NRSA63J-102N	RESISTOR
	R74	NRSA63J-122N	RESISTOR
	R75	NRSA63J-332N	RESISTOR
	R76	NRSA63J-102N	RESISTOR
	R77	NRSA63J-102N	RESISTOR
	R78	NRSA63J-562N	RESISTOR
	R79	NRSA63J-103N	RESISTOR
	R80	NRSA63J-102N	RESISTOR
	R81	NRSA63J-102N	RESISTOR
	R83	NVP1301-471N	V RESISTOR,YH BALANCE
	R84	NRSA63J-102N	RESISTOR
	R86	NRSA63J-103N	RESISTOR
	R87	NRSA63J-103N	RESISTOR
	R90	NRSA63J-105N	RESISTOR
	R91	NRSA63J-561N	RESISTOR
	R104	NRSA63J-121N	RESISTOR
	R105	NRSA63J-270N	RESISTOR
	R106	NRSA63J-270N	RESISTOR
	R107	NRSA63J-102N	RESISTOR
	R108	NRSA63J-102N	RESISTOR
	R109	NRSA63J-332N	RESISTOR
	R110	NVP1301-103N	V RESISTOR,B SET UP
	R111	NRSA63J-102N	RESISTOR
	R116	NRSA63J-472N	RESISTOR
	R117	NRSA63J-102N	RESISTOR
	R118	NRSA63J-102N	RESISTOR
	R119	NVP1301-472N	V RESISTOR,2H ENHANCER BAL
	R120	NRSA63J-681N	RESISTOR
	R121	NRSA63J-102N	RESISTOR
	R122	NRSA63J-102N	RESISTOR
	R123	NVP1301-222N	V RESISTOR,1H ENHANCER BAL
	R124	NRSA63J-102N	RESISTOR
	R125	NRSA63J-751N	RESISTOR
	R126	NRSA63J-222N	RESISTOR
	R127	NRSA63J-122N	RESISTOR
	R128	NRSA63J-271N	RESISTOR
	R129	NRSA63J-222N	RESISTOR
	R141	NRSA63J-105N	RESISTOR
	R143	NRSA63J-102N	RESISTOR
	R144	NVP1301-103N	V RESISTOR,B-Y GAIN
	R145	NRSA63J-102N	RESISTOR
	R146	NRSA63J-102N	RESISTOR
	R147	NVP1301-103N	V RESISTOR,YH GAIN
	R148	NRSA63J-102N	RESISTOR
	R149	NRSA63J-102N	RESISTOR
	R150	NRSA63J-0R0A	RESISTOR
	B6	NRSA63J-0R0A	RESISTOR
	B7	NRSA63J-0R0A	RESISTOR
	C1	NCT07CH-220A	CAPACITOR
	C2	NCT07CH-220A	CAPACITOR
	C3	NCB31EK-103A	CAPACITOR
	C4	ECEV0JV220R	E CAPACITOR
		OR NEH10JM-226NZ	E CAPACITOR
		OR NEA20JM-226NZ	E CAPACITOR
	C5	PU56247B-200	TRIMMER CAPACITOR, CLOCK OSC
		OR PU59867-200X	TRIMMER CAPACITOR
	C6	NCT07CH-5R0A	CAPACITOR
	C7	NCT07CH-150A	CAPACITOR
	C8	NCB31EK-103A	CAPACITOR
	C9	NCB31EK-103A	CAPACITOR
	C10	ECEV0JV101P	E CAPACITOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
		OR NEH10JM-107NP	E CAPACITOR
	C12	NCT07CH-220A	CAPACITOR
	C14	NCB31EK-103A	CAPACITOR
	C15	ECEV0JV220R	E CAPACITOR
		OR NEA20JM-226NZ	E CAPACITOR
		OR NEH10JM-226NZ	E CAPACITOR
	C16	NCB31EK-103A	CAPACITOR
	C18	NCB31EK-103A	CAPACITOR
	C19	ECEV1CV100R	E CAPACITOR
		OR NEA21CM-106NZ	E CAPACITOR
		OR NEH11CM-106NZ	E CAPACITOR
	C20	NCB31EK-103A	CAPACITOR
	C21	ECEV1CV100R	E CAPACITOR
		OR NEA21CM-106NZ	E CAPACITOR
		OR NEH11CM-106NZ	E CAPACITOR
	C22	NCT07CH-150A	CAPACITOR
	C26	NCB31EK-103A	CAPACITOR
	C27	ECEV1CV470P	E CAPACITOR
	C28	NCB31EK-103A	CAPACITOR
	C29	NCB31EK-103A	CAPACITOR
	C30	NCB31EK-103A	CAPACITOR
	C31	ECEV1CV470P	E CAPACITOR
	C32	NCB31EK-103A	CAPACITOR
	C33	ECEV1CV100R	E CAPACITOR
		OR NEH11CM-106NZ	E CAPACITOR
		OR NEA21CM-106NZ	E CAPACITOR
	C34	NCB31EK-103A	CAPACITOR
	C35	NCB31EK-103A	CAPACITOR
	C36	NCB31EK-103A	CAPACITOR
	C37	ECEV1EV4R7R	E CAPACITOR
		OR NEA21EM-475NZ	E CAPACITOR
	C38	NCB31EK-103A	CAPACITOR
	C39	NCB31EK-103A	CAPACITOR
	C40	ECEV1EV4R7R	E CAPACITOR
		OR NEA21EM-475NZ	E CAPACITOR
	C41	NCB31EK-103A	CAPACITOR
	C43	YU40265-3	E CAPACITOR
	C45	QEF81CM-105	TANTAL CAPACITOR
	C48	QEE81AM-226	TANTAL CAPACITOR
	C49	YU40265-3	E CAPACITOR
	C50	QEE80JM-226	TANTAL CAPACITOR
	C52	ECEV0JV220R	E CAPACITOR
		OR NEH10JM-226NZ	E CAPACITOR
		OR NEA20JM-226NZ	E CAPACITOR
	C53	QEF81CM-105	TANTAL CAPACITOR
	C54	PU59758-105	CAPACITOR
		OR QCF81CZ-105	CAPACITOR
	C55	NCR21CM-473A	CAPACITOR
		OR PU59913-473	CAPACITOR
	C56	NCR21CM-473A	CAPACITOR
		OR PU59913-473	CAPACITOR
	C57	NCR21CM-473A	CAPACITOR
		OR PU59913-473	CAPACITOR
	C58	PU59758-105	CAPACITOR
		OR QCF81CZ-105	CAPACITOR
	C59	NCR21CM-473A	CAPACITOR
		OR PU59913-473	CAPACITOR
	C60	NCR21CM-473A	CAPACITOR
		OR PU59913-473	CAPACITOR
	C61	NCR21CM-473A	CAPACITOR
		OR PU59913-473	CAPACITOR
	C62	PU59758-105	CAPACITOR
		OR QCF81CZ-105	CAPACITOR
	C63	QCY81EK-473	CAPACITOR
	C64	QCY81EK-473	CAPACITOR
	C65	NCR21CM-473A	CAPACITOR
		OR PU59913-473	CAPACITOR
	C66	NCR21CM-473A	CAPACITOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
		OR PU59913-473	CAPACITOR
	C67	QCY81EK-473	CAPACITOR
	C68	QCY81EK-473	CAPACITOR
	C69	ECEV1CV100R	E CAPACITOR
		OR NEA21CM-106NZ	E CAPACITOR
	C71	QEF81AM-226	TANTAL CAPACITOR
		OR QEF81CM-226	TANTAL CAPACITOR
	C72	NCB31EK-103A	CAPACITOR
	C74	NCB31EK-103A	CAPACITOR
	C75	NCR21CM-473A	CAPACITOR
		OR PU59913-473	CAPACITOR
	C76	NCB31EK-103A	CAPACITOR
	C77	ECEV0JV220R	E CAPACITOR
		OR NEA20JM-226NZ	E CAPACITOR
	C80	YU40265-1	E CAPACITOR
	C81	NCB31EK-103A	CAPACITOR
	C91	QEF81AM-475	TANTAL CAPACITOR
	C92	QEF81VM-334	TANTAL CAPACITOR
	C94	QEF81VM-334	TANTAL CAPACITOR
	C95	QEF81AM-475	TANTAL CAPACITOR
	C96	NCB31EK-103A	CAPACITOR
	C97	NCR21CM-473A	CAPACITOR
		OR PU59913-473	CAPACITOR
	C98	NCB31EK-103A	CAPACITOR
	C99	QEF81AM-475	TANTAL CAPACITOR
	C100	NCB31EK-103A	CAPACITOR
	C101	ECEV0JV220R	E CAPACITOR
		OR NEH10JM-226NZ	E CAPACITOR
		OR NEA20JM-226NZ	E CAPACITOR
	C102	NCB31EK-103A	CAPACITOR
	C103	ECEV1CV100R	E CAPACITOR
		OR NEA21CM-106NZ	E CAPACITOR
	C104	NCB31EK-103A	CAPACITOR
	C121	ECEV1EV4R7R	E CAPACITOR
		OR NEA21EM-475NZ	E CAPACITOR
	L101	YU40248-220KY	COIL
	L102	YU40248-220KY	COIL
	L103	PU58201-120K	COIL
	L105	YU40248-220KY	COIL
	L106	YU40248-220KY	COIL
	L107	PU58201-120K	COIL
	L108	PU58201-101K	COIL
	L111	YU40248-220KY	COIL
	L112	YU40248-220KY	COIL
	L115	YU40248-220KY	COIL
	L116	YU40248-220KY	COIL
	L117	YU40248-220KY	COIL
	EQ101	YU40526	EQUALIZER
	LPF103	YU40525	LOW PASS FILTER
	LPF104	YU40444	LOW PASS FILTER
		OR YU40600-P	LOW PASS FILTER
	LPF105	YU40443	LOW PASS FILTER
	LPF106	YU40444	LOW PASS FILTER
		OR YU40600-P	LOW PASS FILTER
⚠	X101	YU40524	CRYSTAL RESONATOR
	TRAP101	YU40453-Z	TRAP
	SLD1	YQ40538	SHEET,X2
	SLD2	YU40341	INSULATER
	SPC1	PU59915-107	SPACER
	SPC2	PU59915-107	SPACER
	SPC3	PU59915-105	#500SPACER0.010

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	TP101	YU40648	TEST PIN
	TP102	YU40648	TEST PIN
	TP103	YU40648	TEST PIN
	TP104	YU40648	TEST PIN
	TP105	YU40648	TEST PIN
	TP106	YU40648	TEST PIN
	TP107	YU40648	TEST PIN
	TP108	YU40648	TEST PIN
	TP109	YU40648	TEST PIN
	TP110	YU40648	TEST PIN
	TP113	YU40648	TEST PIN
	TP114	YU40648	TEST PIN
	TP115	YU40648	TEST PIN
	TP116	YU40648	TEST PIN
	CN101	YU40101-12	1.5 B/B (R/A)
	CN102	YU40101-12	1.5 B/B (R/A)
	CN103	YU40101-20	BOARD TO BOARD
	CN105	YU40251-9	BOARD TO BOARD
	CN106	YU40251-13	BOARD TO BOARD

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* 15. VIDEO-2 BOARD ASSEMBLY <22> *

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	PWBA	YB20017X-01-C	VIDEO-2 BOARD ASSY
	IC201	UPC2371GH	IC
	IC202	MSM6985MS	IC
	IC203	MSM6985MS	IC
	Q201	2SC3936(BC)	TRANSISTOR
		OR 2SC4098(PQ)	TRANSISTOR
	Q203	2SC3936(BC)	TRANSISTOR
		OR 2SC4098(PQ)	TRANSISTOR
	Q204	2SA1576(QR)	TRANSISTOR
		OR 2SA1532(BC)	TRANSISTOR
	Q205	2SC3936(BC)	TRANSISTOR
		OR 2SC4098(PQ)	TRANSISTOR
	Q206	2SA1576(QR)	TRANSISTOR
		OR 2SA1532(BC)	TRANSISTOR
	Q208	2SA1576(QR)	TRANSISTOR
		OR 2SA1532(BC)	TRANSISTOR
	Q209	2SC3936(BC)	TRANSISTOR
	R201	NRSA63J-333N	RESISTOR
	R202	NRSA63J-222N	RESISTOR
	R203	NRSA63J-822N	RESISTOR
	R204	NRSA63J-333N	RESISTOR
	R205	NRSA63J-393N	RESISTOR
	R206	NRSA63J-563N	RESISTOR
	R207	NRSA63J-333N	RESISTOR
	R208	NRSA63J-223N	RESISTOR
	R209	NRSA63J-183N	RESISTOR
	R210	NRSA63J-333N	RESISTOR
	R212	NRSA63J-333N	RESISTOR
	R214	NRSA63J-103N	RESISTOR
	R215	NRSA63J-333N	RESISTOR
	R216	NRSA63J-123N	RESISTOR
	R217	NRSA63J-102N	RESISTOR
	R218	NRSA63J-102N	RESISTOR
	R219	NRSA63J-102N	RESISTOR
	R220	NRSA63J-102N	RESISTOR
	R221	NRSA63J-333N	RESISTOR
	R222	NRSA63J-273N	RESISTOR
	R223	NRSA63G-153N	RESISTOR
	R224	NRSA63J-133N	RESISTOR
	R225	NRSA63J-102N	RESISTOR
	R226	NRSA63J-102N	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R227	NRSA63J-102N	RESISTOR
	R228	NRSA63J-123N	RESISTOR
	R229	NVP1301-473N	V RESISTOR, COLOR OFF SET
	R230	NRSA63J-223N	RESISTOR
	R232	NRSA63J-102N	RESISTOR
	R241	NRSA63J-152N	RESISTOR
	R242	NRSA63J-102N	RESISTOR
	R243	NRSA63J-102N	RESISTOR
	R244	NVP1301-103N	V RESISTOR,COLOR DIFF BAL
	R245	NRSA63J-152N	RESISTOR
	R246	NRSA63J-102N	RESISTOR
	R247	NRSA63J-102N	RESISTOR
	R248	NVP1301-103N	V RESISTOR,NOISE SUP
	R249	NRSA63J-222N	RESISTOR
	R250	NRSA63J-222N	RESISTOR
	C201	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C202	NCB31EK-103A	CAPACITOR
	C203	NCT07CH-150A	CAPACITOR
	C204	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C205	NCB31EK-103A	CAPACITOR
	C206	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C207	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C208	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C209	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C210	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C211	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C212	NCB31EK-103A	CAPACITOR
	C213	ECEV0JV220R	E CAPACITOR
	C214	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C215	QEF80GM-226	TANTAL CAPACITOR
	C221	NCB31EK-103A	CAPACITOR
	C222	NCB31EK-103A	CAPACITOR
	C223	QEF81AM-475	TANTAL CAPACITOR
	C224	QCFA1EZ-104	CAPACITOR
	C225	NCB31EK-103A	CAPACITOR
	C226	NCB31EK-103A	CAPACITOR
	C227	NCB31EK-103A	CAPACITOR
	C228	NCB31EK-103A	CAPACITOR
	C229	QEF81AM-475	TANTAL CAPACITOR
	C230	NCB31EK-103A	CAPACITOR
	C231	QCFA1EZ-104	CAPACITOR
	C232	NCB31EK-103A	CAPACITOR
	C233	ECEV0JV220R	E CAPACITOR
	C234	ECEV1CV100R	E CAPACITOR
	L201	PU58201-120K	COIL
	L203	PU58201-120K	COIL
	L204	PU58201-120K	COIL
	EQ201	YU40127-2	EQUALIZER
	EQ202	YU40082-3	EQUALIZER
	LPF201	YU40392	LOW PASS FILTER
	LPF202	YU40392	LOW PASS FILTER
	DL201	YU40909-P	DELAY LINE
	TP201	YU40648	TEST PIN
	TP202	YU40648	TEST PIN
	CN205	YU40252-9	BOARD TO BOARD
	CN206	YU40252-13	BOARD TO BOARD

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16. CAMERA CONTROL BOARD ASSEMBLY <27>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20078A1	CAMERA CLT BOARD ASSY
	IC1	TC4S71F	IC
	Q1	2SD602(Q)	TRANSISTOR
	Q2	2SD602(Q)	TRANSISTOR
	Q3	2SD602(QR)	TRANSISTOR
	D1	SLN-210VC74	LE DIODE
	D2	RD8.2ESB	ZENER DIODE
	R1	QRSA08J-222YN	RESISTOR
	R2	QRSA08J-222YN	RESISTOR
	R3	QRSA08J-332YN	RESISTOR
	R4	QRSA08J-472YN	RESISTOR
	R5	QRSA08J-182YN	RESISTOR
	R6	QRSA08J-333YN	RESISTOR
	R7	QRSA08J-223YN	RESISTOR
	R8	QRSA08J-103YN	RESISTOR
	R9	QRSA08J-682YN	RESISTOR
	R10	QRSA08J-223YN	RESISTOR
	R11	QRSA08J-152YN	RESISTOR
	R12	QRSA08J-152YN	RESISTOR
	R13	QRSA08J-182YN	RESISTOR
	R14	QRSA08J-222YN	RESISTOR
	R15	QRSA08J-103YN	RESISTOR
	R17	QRSA08J-223YN	RESISTOR
	R18	QRSA08J-563YN	RESISTOR
	R19	QRSA08J-273YN	RESISTOR
	R20	QRSA08J-0R0YN	RESISTOR
	C1	QCFA1EZ-104	CAPACITOR
	C2	YU40265-5	E CAPACITOR
	L1	YU40601-12	CHOKE COIL
	SW1	PU57008	TACT SWITCH
	SW2	PU57008	TACT SWITCH
	SW3	PU57008	TACT SWITCH
	SW4	PU57008	TACT SWITCH
	SW5	PU57008	TACT SWITCH
	SW6	PU57008	TACT SWITCH
	SW7	PU57008	TACT SWITCH
	SW8	PU57008	TACT SWITCH
	SW9	PU57008	TACT SWITCH
	SW10	PU57008	TACT SWITCH
	SW11	PU57008	TACT SWITCH
	SW12	PU57008	TACT SWITCH
	SW13	PU57008	TACT SWITCH
	SW14	PU57008	TACT SWITCH
	SW15	PU57008	TACT SWITCH
	SW16	PU57008	TACT SWITCH
	SW17	PU55583	SLIDE SWITCH
	SW18	YU40111	SLIDE SW.
	CN2	YU40106-10	1.0 FPC R/A(U)
	CN3	YU40108-10	1.0 FPC R/A(D)
	CN4	YU40095-2	W/B CN.WFR R/A
	CN6	ML-Y00131B	B.IN WIRE
	CN7	YU40095-2B	W/B CN.WFR R/A

17. F.E.H BOARD ASSEMBLY <08>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	PU59703C	F.E.H.BOARD ASSY
	IC1	3VT03	IC
	C1	QER41CM-106	E CAPACITOR
	C2	QFV41HJ-473	M CAPACITOR

18. START SENSOR BOARD ASSEMBLY <09>

	PWBA	YB10013A6	START SENSER BOARD ASSY
	Q802	TPS605	PHOTO TRANSISTOR
	C802	QCVC1CN-103	CAPACITOR

19. ENCODER BORAD ASSEMBLY <23>

	PWBA	YB20033C-C	ENCODER BOARD ASSY
	IC301	AN2275S	IC
	IC302	TC4S69F	IC
	IC303	MC8181D	IC
	IC304	TC4S71F	IC
	IC305	H8D7051A	IC
	Q301	2SC3936(BC)	TRANSISTOR
	OR	2SC4098(PQ)	TRANSISTOR
	OR	2SC4177(56)	TRANSISTOR
	Q302	2SC3936(BC)	TRANSISTOR
	OR	2SC4098(PQ)	TRANSISTOR
	OR	2SC4177(56)	TRANSISTOR
	Q303	2SC3936(BC)	TRANSISTOR
	OR	2SC4098(PQ)	TRANSISTOR
	OR	2SC4177(56)	TRANSISTOR
	Q304	2SC3936(BC)	TRANSISTOR
	OR	2SC4177(56)	TRANSISTOR
	OR	2SC4098(PQ)	TRANSISTOR
	Q305	2SA1532(BC)	TRANSISTOR
	OR	2SA1576(QR)	TRANSISTOR
	OR	2SA1611(56)	TRANSISTOR
	Q306	2SK620	FE TRANSISTOR
	Q307	2SK620	FE TRANSISTOR
	Q309	2SC3936(BC)	TRANSISTOR
	OR	2SC4098(PQ)	TRANSISTOR
	OR	2SC4177(56)	TRANSISTOR
	Q310	2SC3936(BC)	TRANSISTOR
	OR	2SC4177(56)	TRANSISTOR
	OR	2SC4098(PQ)	TRANSISTOR
	D301	RD7.5M-T1B2	ZENER DIODE
	D302	MA141WK	DIODE
	R301	NRSA63J-332N	RESISTOR
	R302	NRSA63J-272N	RESISTOR
	R303	NRSA63J-272N	RESISTOR
	R304	NRSA63J-471N	RESISTOR
	R305	NRSA63J-681N	RESISTOR
	R306	NRSA63J-681N	RESISTOR
	R307	NVP1301-222N	V RESISTOR,BURST PHASE
	R308	NRSA63J-102N	RESISTOR
	R309	NVP1301-103N	V RESISTOR,WHITE CLIP
	R310	NRSA63J-102N	RESISTOR
	R311	NRSA63J-391N	RESISTOR
	R313	NVP1301-103N	V RESISTOR,SYNC LEVEL
	R314	NRSA63J-822N	RESISTOR
	R315	NRSA63J-271N	RESISTOR
	R316	NRSA63J-102N	RESISTOR
	R317	NRSA63J-100N	RESISTOR
	R318	NRSA63J-561N	RESISTOR
	R319	NRSA63J-561N	RESISTOR
	R320	QRD161J-222	RESISTOR
	R323	NRSA63J-102N	RESISTOR
	R324	NRSA63J-103N	RESISTOR
	R325	NRSA63J-103N	RESISTOR
	R326	NVP1301-473N	V RESISTOR,R-Y CARRIER BAL
	R327	NVP1301-473N	V RESISTOR,B-Y CARRIER BAL
	R328	NRSA63J-473N	RESISTOR
	R329	NRSA63J-102N	RESISTOR
	R330	NVP1301-103N	V RESISTOR,COLOR PHASE
	R332	NRSA63J-102N	RESISTOR
	R333	NVP1301-103N	V RESISTOR,COLOR GAIN
	R334	NRSA63J-102N	RESISTOR
	R335	NRSA63J-223N	RESISTOR
	R336	NVP1301-103N	V RESISTOR,BURST LEVEL
	R337	NRSA63J-223N	RESISTOR
	R338	NRSA63J-102N	RESISTOR
	R339	NRSA63J-102N	RESISTOR
	R340	NRSA63J-102N	RESISTOR
	R341	NRSA63J-100N	RESISTOR
	R343	NRSA63J-222N	RESISTOR
	R345	NRSA63J-103N	RESISTOR
	R346	NRSA63J-103N	RESISTOR
	R347	NRSA63J-222N	RESISTOR
	R348	NRSA63J-223N	RESISTOR
	R349	NRSA63J-103N	RESISTOR
	R350	NRSA63J-103N	RESISTOR
	R351	NRSA63J-472N	RESISTOR
	R352	NRSA63J-472N	RESISTOR
	R353	NVP1301-473N	V RESISTOR,B-Y LINE SW CAR BAL
	R354	NVP1301-473N	V RESISTOR,R-Y LINE SW CAR BAL
	R355	NVP1301-103N	V RESISTOR,R-Y PHASE SHIFT
	R356	NRSA63J-331N	RESISTOR
	R357	NRSA63J-821N	RESISTOR
	R358	NRSA63J-821N	RESISTOR
	R359	NRSA63J-471N	RESISTOR
	R360	NRSA63J-473N	RESISTOR
	B301	NRSA63J-0R0A	RESISTOR
	B302	NRSA63J-0R0A	RESISTOR
	B303	NRSA63J-0R0A	RESISTOR
	B304	NRSA63J-0R0A	RESISTOR
	B305	QRSA08J-0R0Y	RESISTOR
	B307	QRSA08J-0R0Y	RESISTOR
	B308	NRSA63J-0R0A	RESISTOR
	C301	NCT07CH-560A	CAPACITOR
	C302	NCT07CH-560A	CAPACITOR
	C303	NCT07CH-120A	CAPACITOR
	C304	NCT07CH-390A	CAPACITOR
	C305	NCB31EK-103A	CAPACITOR
	C306	NCB31EK-103A	CAPACITOR
	C307	QED40JM-127	E CAPACITOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C308	NCB31EK-103A	CAPACITOR
	C309	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	C310	NCB31EK-103A	CAPACITOR
	C311	NCB31EK-103A	CAPACITOR
	C312	NCR21CM-473A	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C313	PU59758-105	CAPACITOR
	OR	QCF81CZ-105	CAPACITOR
	C314	QEE40JM-476	TANTAL CAPACITOR
	C315	QEE41CM-476	TANTAL CAPACITOR
	C316	NCB31EK-103A	CAPACITOR
	C317	NCB31EK-103A	CAPACITOR
	C318	PU59758-105	CAPACITOR
	OR	QCF81CZ-105	CAPACITOR
	C319	PU59758-105	CAPACITOR
	OR	QCF81CZ-105	CAPACITOR
	C320	NCR21CM-473A	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C321	QED41AM-107R	E CAPACITOR
	C322	QED41CM-107R	E CAPACITOR
	C324	QEE81AM-685	T.CAP
	C325	QEE81DM-226	TANTAL CAPACITOR
	C326	NCB31EK-103A	CAPACITOR
	C327	NCT07CH-820A	CAPACITOR
	C328	NCT07CH-101A	CAPACITOR
	C329	NCT07CH-101A	CAPACITOR
	C330	NCB31EK-103A	CAPACITOR
	C331	NCF31CZ-104A	CAPACITOR
	C332	NCF31CZ-104A	CAPACITOR
	C333	YU40265-1	E CAPACITOR
	L301	YU40248-101KY	COIL
	L302	YU40248-220KY	COIL
	L303	YU40248-220KY	COIL
	TRAP1	YU40487	TRAP
	BPF301	YU40393-2	BAND PASS FILTER
	OR	YU40599	BAND PASS FILTER
	SLD1	YU40341	INSULATER
	SPC1	PU59915-107	SPACER
	TP301	YU40648	TEST PIN
	TP302	YU40648	TEST PIN
	TP303	YU40648	TEST PIN
	TP304	YU40648	TEST PIN
	TP305	YU40648	TEST PIN
	TP306	YU40648	TEST PIN
	CN301	YU40105-12	1.5 B/B HOUSING
	CN302	YU40105-12	1.5 B/B HOUSING
	CN303	PU58655-10	CAP HOUSING
	CN304	YU40096-2Y	1.25 W/B (R/A)
	CN305	YU40096-4Y	1.25 W/B (R/A)
	CN306	PU58655-3	CAP HOUSING
	CN307	YU40096-2B	1.25 W/B (R/A)
⚠	CP301	ICP-F20	CIRCUIT PROTECTOR
⚠	CP302	ICP-F10	CIRCUIT PROTECTOR

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20. INDICATOR BOARD ASSEMBLY <24>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20057D-02-C	INDICATOR BOARD ASSY
	IC401	VC2059	IC
	IC402	VC2041	IC
	IC403	M54641FP	IC
	IC404	UPC324G2	IC
	IC405	6VT08	IC
	Q401	2SA1532(BC)	TRANSISTOR
	Q403	2SC3936(BC)	TRANSISTOR
	Q404	2SC3936(BC)	TRANSISTOR
	Q405	2SC3936(BC)	TRANSISTOR
	Q406	2SC3936(BC)	TRANSISTOR
	Q407	2SA1532(BC)	TRANSISTOR
	Q408	2SA1532(BC)	TRANSISTOR
	Q409	2SK198P,Q	FE TRANSISTOR
	Q410	2SC3936(BC)	TRANSISTOR
	Q411	2SA1532(BC)	TRANSISTOR
	Q412	2SA1532(B)	TRANSISTOR
	Q413	2SA1532(C)	TRANSISTOR
	D401	RD8.2MB2	ZENER DIODE
	D402	MA704	DIODE
	D403	MA141WK	DIODE
	D404	MA704	DIODE
	D405	MA184	DIODE
	OR	MA185	DIODE
	R401	NRSA63J-122N	RESISTOR
	R402	YU40787	V RESISTOR,IND ADJ
	R404	NRSA63J-104N	RESISTOR
	R406	NRSA63J-104N	RESISTOR
	R407	NRSA63J-0R0A	RESISTOR
	R408	NRSA63J-104N	RESISTOR
	R409	NRSA63J-223N	RESISTOR
	R410	NRSA63J-101N	RESISTOR
	R411	NRSA63J-101N	RESISTOR
	R413	NRSA63J-222N	RESISTOR
	R415	NRSA63J-472N	RESISTOR
	R416	NRSA63J-472N	RESISTOR
	R417	NRSA63J-153N	RESISTOR
	R418	NRSA63J-103N	RESISTOR
	R420	NRSA63J-222N	RESISTOR
	R421	NRSA63J-222N	RESISTOR
	R422	NRSA63J-473N	RESISTOR
	R423	NRSA63J-682N	RESISTOR
	R424	NRSA63J-333N	RESISTOR
	R425	NRSA63J-103N	RESISTOR
	R426	NRSA63J-152N	RESISTOR
	R427	NRSA63J-222N	RESISTOR
	R428	NRSA63J-152N	RESISTOR
	R429	NRSA63J-472N	RESISTOR
	R430	NRSA63J-101N	RESISTOR
	R431	NRSA63J-472N	RESISTOR
	R432	NRSA63J-333N	RESISTOR
	R433	NRSA63J-223N	RESISTOR
	R434	NRSA63J-101N	RESISTOR
	R435	NRSA63J-333N	RESISTOR
	R436	NRSA63J-223N	RESISTOR
	R437	NRSA63J-473N	RESISTOR
	R438	NRSA63J-473N	RESISTOR
	R439	NRSA63J-122N	RESISTOR
	R440	NRSA63J-683N	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R441	NRSA63J-682N	RESISTOR
	R442	NRSA63J-153N	RESISTOR
	R443	NRSA63J-222N	RESISTOR
	R445	NRSA63J-272N	RESISTOR
	R446	NVP1301-102N	V RESISTOR,IRIS ADJ
	R447	NRSA63J-222N	RESISTOR
	R448	NRSA63J-560N	RESISTOR
	R449	NRSA63J-273N	RESISTOR
	R450	NRSA63J-223N	RESISTOR
	R451	NRSA63J-473N	RESISTOR
	R452	NRSA63J-123N	RESISTOR
	R453	NRSA63J-123N	RESISTOR
	R454	NRSA63J-103N	RESISTOR
	R455	NRSA63J-103N	RESISTOR
	R457	NRSA63J-0R0A	RESISTOR
	R458	NRSA63J-102N	RESISTOR
	R459	NRSA63J-103N	RESISTOR
	R460	NRSA63J-103N	RESISTOR
	R462	NRSA63J-0R0A	RESISTOR
	R463	NRSA63J-333N	RESISTOR
	R464	NRSA63J-682N	RESISTOR
	R465	NRSA63J-104N	RESISTOR
	R466	NRSA63J-104N	RESISTOR
	R467	NRSA63J-104N	RESISTOR
	R469	NRSA63J-104N	RESISTOR
	R470	NRSA63J-105N	RESISTOR
	R471	NRSA63J-104N	RESISTOR
	R473	NRSA63J-0R0A	RESISTOR
	R474	NRSA63J-222N	RESISTOR
	R475	NRSA63J-222N	RESISTOR
	R476	NRSA63J-0R0A	RESISTOR
	R477	NRSA63J-0R0A	RESISTOR
	R478	NRSA63J-0R0A	RESISTOR
	R479	ERT-D2FGL601S	RESISTOR
	OR	NTH5D471LA	RESISTOR
	OR	NTH5D471KA	RESISTOR
	B401	NRSA63J-0R0A	RESISTOR
	B402	NRSA63J-0R0A	RESISTOR
	B403	NRSA63J-0R0A	RESISTOR
	B404	NRSA63J-0R0A	RESISTOR
	B405	NRSA63J-0R0A	RESISTOR
	B406	NRSA63J-0R0A	RESISTOR
	C402	NCF31CZ-104A	CAPACITOR
	C403	QEE81AM-226	TANTAL CAPACITOR
	C404	QCFA1EZ-104	CAPACITOR
	C405	NCT07CH-180A	CAPACITOR
	C406	NCT07CH-220A	CAPACITOR
	C407	NCT07CH-220A	CAPACITOR
	C408	QEF80JM-106	TANTAL CAPACITOR
	C409	QER40JM-226	E CAPACITOR
	C410	QCFA1EZ-104	CAPACITOR
	C411	QER41CM-106	E CAPACITOR
	C412	ECEV0JV220R	E CAPACITOR
	C413	PU59758-105	CAPACITOR
	OR	QCF81CZ-105	CAPACITOR
	C414	ECEV1CV100R	E CAPACITOR
	C415	ECEV0JV220R	E CAPACITOR
	OR	NEA20JM-226NZ	E CAPACITOR
	C416	NCT07CH-101A	CAPACITOR
	C417	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C418	QEF80GM-226	TANTAL CAPACITOR
	C419	QEF80JM-106	TANTAL CAPACITOR
	C420	QEF80JM-475	TANTAL CAPACITOR
	C421	QEF81EM-474	TANTAL CAPACITOR
	C422	ECEV1CV100R	E CAPACITOR
	C423	NCB31EK-103A	CAPACITOR
	C424	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C425	NCS31HK-221A	CAPACITOR
	C426	NCF31CZ-104A	CAPACITOR
	C427	NCF31CZ-104A	CAPACITOR
	C428	NCF31CZ-104A	CAPACITOR
	C429	NCF31CZ-104A	CAPACITOR
	C430	NCF31CZ-104A	CAPACITOR
	C431	NCF31CZ-104A	CAPACITOR
	C432	NCF31CZ-104A	CAPACITOR
	C433	NCF31CZ-104A	CAPACITOR
	C436	NCB31EK-103A	CAPACITOR
	C1000	QEE81AM-476	E CAPACITOR,THIS IS C408-2.
	L401	PU58201-120K	COIL
	L402	PU58201-120K	COIL
	L403	PU58201-120K	COIL
	L404	PU58201-120K	COIL
	L405	PU58201-120K	COIL
	L406	PU58201-120K	COIL
⚠	X401	YU40141	CRYSTAL RESONATOR
	SLD401	YU40341	INSULATER
	CN401	YU40179-110	W/B CN. WAFER-R
	CN402	YU40108-10	W/B CN. WAFER-R
	CN403	YU40105-20	B/B HOUSING-DS
	CN404	YU40105-10	B/B HOUSING-DS
	CN405	YU40096-7	W/B CN.WFR R/A
	CN406	YU40096-4	W/B CN.WFR R/A
	CN407	YU40096-2	W/B CN.WFR R/A
	CN408	YU40096-10	W/B CN.WFR R/A
	CN409	YU40096-2R	W/B CN.WFR R/A
	CN410	YU40096-2B	W/B CN.WFR R/A

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21. FULL AUTO BOARD ASSEMBLY <25>

REF NO.	PART NO.	PART NAME, DESCRIPTION
PWBA	YB20097B-01-C	FAW BOARD ASSY
IC501	VC2038	IC
IC502	BA10324F	DIODE
OR	IR3702N1	IC
OR	UPC324G2	IC
IC503	BA10324F	DIODE
OR	UPC324G2	IC
OR	IR3702N1	IC
D501	MA716	DIODE
D502	MA716	DIODE
PD501	PD170V1	PHOTO DIODE
R501	NRSA63J-154N	RESISTOR
R502	NRSA63J-123N	RESISTOR
R503	NVP1301-223N	V RESISTOR,AW INDOOR B
R504	NRSA63J-563N	RESISTOR
R505	NRSA63J-183N	RESISTOR
R506	NVP1301-223N	V RESISTOR,AW INDOOR R
R507	NRSA63J-563N	RESISTOR
R508	NRSA63J-223N	RESISTOR
R509	NRSA63J-683N	RESISTOR
R511	NRSA63J-473N	RESISTOR
R512	NRSA63J-473N	RESISTOR
R513	NRSA63J-823N	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R514	NRSA63J-153N	RESISTOR
	R515	NVP1301-473N	V RESISTOR,AW R INDOOR LIM
	R516	NRSA63J-473N	RESISTOR
	R517	NRSA63J-0R0A	RESISTOR
	R518	NVP1301-473N	V RESISTOR,AW R OUTDOOR LIM
	R519	NRSA63J-333N	RESISTOR
	R520	NRSA63J-0R0A	RESISTOR
	R521	NVP1301-473N	V RESISTOR,PRE B INDOOR
	R522	NRSA63J-473N	RESISTOR
	R523	NRSA63J-0R0A	RESISTOR
	R524	NVP1301-473N	V RESISTOR,PRE B FL
	R525	NRSA63J-473N	RESISTOR
	R526	NRSA63J-0R0A	RESISTOR
	R527	NVP1301-473N	V RESISTOR,PRE B OUTDOOR
	R528	NRSA63J-473N	RESISTOR
	R529	NRSA63J-0R0A	RESISTOR
	R530	NVP1301-473N	V RESISTOR,AW B OUTDOOR LIM
	R531	NRSA63J-563N	RESISTOR
	R533	NRSA63J-153N	RESISTOR
	R534	NVP1301-473N	V RESISTOR,AW B INDOOR LIM
	R535	NRSA63J-473N	RESISTOR
	R536	NRSA63J-0R0A	RESISTOR
	R537	NVP1301-473N	V RESISTOR,PRE R INDOOR
	R538	NRSA63J-473N	RESISTOR
	R539	NRSA63J-0R0A	RESISTOR
	R540	NVP1301-473N	V RESISTOR,PRE R FL
	R541	NRSA63J-473N	RESISTOR
	R542	NRSA63J-0R0A	RESISTOR
	R543	NVP1301-473N	V RESISTOR,PRE R OUTDOOR
	R544	NRSA63J-473N	RESISTOR
	R548	NRSA63J-104N	RESISTOR
	R549	NVP1301-224N	V RESISTOR,AW B GAIN
	R550	NRSA63J-103N	RESISTOR
	R551	NRSA63J-153N	RESISTOR
	R553	NVP1301-224N	V RESISTOR,AW R GAIN
	R554	NRSA63J-103N	RESISTOR
	R555	NRSA63J-104N	RESISTOR
	R556	NRSA63J-153N	RESISTOR
	R557	NRSA63J-182N	RESISTOR
	R558	NRSA63J-122N	RESISTOR
	R559	NRSA63J-102N	RESISTOR
	R560	NRSA63J-471N	RESISTOR
	R561	NRSA63J-103N	RESISTOR
	R562	NRSA63J-103N	RESISTOR
	R565	NRSA63J-153N	RESISTOR
	R579	NRSA63J-472N	RESISTOR
	R580	NRSA63J-0R0A	RESISTOR
	B601	NRSA63J-0R0A	RESISTOR
	B602	NRSA63J-0R0A	RESISTOR
	B603	NRSA63J-0R0A	RESISTOR
	B604	NRSA63J-0R0A	RESISTOR
	B605	NRSA63J-0R0A	RESISTOR
	B606	NRSA63J-0R0A	RESISTOR
	B607	NRSA63J-0R0A	RESISTOR
	B608	NRSA63J-0R0A	RESISTOR
	C501	NEH11CM-106NZ	E CAPACITOR
	C502	PU59758-105	CAPACITOR
	C503	NCB31EK-103A	CAPACITOR
	C504	NEH10GM-476NZ	E CAPACITOR
	C505	NCB31HK-152A	CAPACITOR
	C506	NCB31HK-152A	CAPACITOR
	C507	NCB31HK-152A	CAPACITOR
	C508	NEH10GM-476NZ	E CAPACITOR
	C509	NEH10JM-226NZ	E CAPACITOR
	C510	NCB31EK-103A	CAPACITOR
	C511	NCB31EK-103A	CAPACITOR
	C515	NEH11EM-475NZ	E CAPACITOR
	C516	NEH11EM-475NZ	E CAPACITOR
	L501	PU58201-220K	COIL
	FIL1	YQ40394	WHITE FILTER
	SLD1	YQ40395	W.B.SHIELD CASE
	SLD2	YQ40396	W.B.SHIELD PLATE
	TP501	YU40648	TEST PIN
	TP502	YU40648	TEST PIN
	TP503	YU40648	TEST PIN
	TP504	YU40648	TEST PIN
	CN501	YU40101-10	BOARD TO BOARD

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22. DRUM BOARD <30>

	PWBA	PDM3166	BOARD (UPPER DRUM)

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23. END SENSOR BOARD ASSEMBLY <10>

	PWBA	YB10013A7	END SENSER BOARD ASSY
	Q801	PN268R	PHOTO TRANSISTOR
	C801	QCVC1CN-103	CAPACITOR
	SPC1	YQM30029-2	SPACER

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24. MODE SENSOR BOARD ASSEMBLY <17>

	PWBA	PUS37230C	MODE SENS. BOARD ASSY
	Q1	PT431F	PHOTO TRANSISTOR
	Q2	PT431F	PHOTO TRANSISTOR
	D1	GL430	EMITTING DIODE
	D2	GL430	EMITTING DIODE
	R1	QRD161J-222	RESISTOR
	BKT1	PQ30978	MODE SENSOR BRACKET